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An Address on

OBSTETRICS DURING THE PAST TWENTY-FIVE YEARS*

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SOME one, possibly not Lot, suggested that at certain milestones of the travelled road it is wise to stop and look back. To-day, after approximately twenty-five years of practical obstetrics, I ask you to turn for a few moments to my quarter-century picture, to note its landmarks; and then, as prognosis from diagnosis, to outline, not too boldly, the future. Certain features seem marked as definite phases of development and among these may be mentioned the change of obstetrics from a medical to a surgical specialty; the altered attitude towards the incidence of puerperal infection; the realization of birth trauma as a more or less definite clinical entity; more regard for the child as a factor in the successful delivery of the mother, and, with that, increased care for the mother during pregnancy, with a view to safeguarding both mother and child.

The older obstetrician was not a surgeon. The largest obstetric practice was enjoyed by the man with the largest general practice; and the younger men, who by inclination would turn from the practice of obstetrics, were urged to undertake the work as a basis for family practice. There were few, if any, specialists; and the idea of a man specializing in any subdepartment of medicine was frowned upon heavily by those whose years of experience had given them rank as authorities in special branches of practice. The loss of a mother under

labour was looked upon rather as the act of God, provided the attendant had done all that could be reasonably expected; difficult labours were attended by an unfortunately high foetal mortality, since delayed labour allowed of but two solutions; either the dragging through of a head disproportionate to the mother's pelvis by means of a forceps, or in many cases a craniotomy, or the unusual operation of Caesarean section. Caesarean section, rarely considered as an elective operation, was done by a surgeon, not an obstetrician, on a patient usually a bad risk on account of exhaustion, and of exposure to infection. It was done with meticulous care to avoid blood loss, with a consequent extravagance in the matter of time, which still further prejudiced the chances of the mother and child. Those of you who see to-day the delivery of a perfectly healthy, non-asphyxiated child within a moment or two of the complete anaesthesia of the patient will scarcely remember the slow, deliberate ligation of all vessels and the control of the uterine arteries, practised by the early operators, and the subsequent delivery, after approximately one halfhour, of a child in white asphyxia, whose subsequent resuscitation was the signal for prolonged cheering and the collection of an uncertain amount in silver and copper for the inevitable tribute to young Caesar. Mothers died as a matter of course. For many years it has been my practice to enquire among the students how many have lost a relative as the result of

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childbirth. It is safe to say that fully onequarter of the class answers in the affirmative. Those of you who have been in Barr's clinic in Paris may remember the motto "Craniotomy on the live child has had its day." Twenty-five years ago such was certainly not the case.

Closely associated with maternal death in labour was the question of infection. You may remember that Pasteur's work, which resulted in the discovery of the streptococcus and the Vibrion septique, another name for the gas bacillus of the Great War, was in part based on an investigation on the bodies of women dying of puerperal fever. The observations of Pasteur were the foundations of Listerism; but the methods of Lister, essentially surgical, were slow to find their way to the men most earnestly employed in the practice of obstetrics. True, a certain amount of attention was paid to the possibility of infection; but there was a deep rooted belief that the prevention of infection was, in certain cases impossible, and I well remember the amazement of certain of my colleagues when I suggested to them on the opening of the Montreal Maternity Hospital, the idea of personal responsibility for infection. The use of rubber gloves was unknown; with the unpleasantness of vaginal examination without gloves was always associated the possibility of venereal infection. Without rubber gloves, rectal examination was, naturally, out of the question. The incidence of fever was so frequent that milk fever was offered as a solution for the almost inevitable rise on the third or fourth day, and the persistent administration of castor oil on the morning of the third day to puerperal patients is, to my mind, a relic of the prophylactic treatment of those expecting milk fever. Trauma during labour was often unrecognized. It was not unusual to hear men speak of conducting hundreds of confinements without having had a perineal tear. Yet there came in great numbers to those new specialists, the gynecologists, patients with all sorts of complaints, and among them innumerable cases with symptoms attributable to extensive laceration both of the uterus and of the perineum. Too often, the specialists, not recognizing the original cause of the trouble, undertook operations such as fixation of the uterus and amputation of the cervix, which, while technically

satisfactory, added to the original disability which had resulted in their production. One well recognized fact was that a woman who had had many children was permanently marked thereby, and a so-called "pendulous belly" was no abnormality in the average multipara. The incidence of kidney disorders during pregnancy was not anticipated and the practitioner's first intimation of such trouble was often the report that the patient had had a convulsion; while another kidney complication, pyelitis, now recognized as fairly frequent, had practically never been observed.

That conditions were so different is not difficult to understand when one remembers that the average student before graduation rarely had the opportunity to come in contact with and to examine pregnant women; and attendance at labour gave little opportunity for the observation of its complete course. One thing, however, I do remember and that is, that in the old days we were often content to wait twelve to twenty-four hours and, sometimes, thirty-six hours, that we might be present at the termination of, what was hoped might be, a spontaneous labour; whereas, now, it is sometimes difficult to obtain the presence of students in the case room though called when delivery is imminent, a frequent question being "Do you think it is going to be an ordinary, normal case?"

With the full admission of obstetrics as a surgical specialty, as we undoubtedly must admit to-day, are the results better, and wherein have they improved? Recently I noted an address by Dr. Helen MacMurchy, that able woman associated with the Department of Health in Ottawa, in which she made the statement that the maternal mortality in childbirth for all Canada was, approximately, five per thousand. Those of you who wish to know whether this figure is high or no, I would refer to an article by Mosher in the March number of the American Journal of Obstetrics and Gynecology. Not only is it evident that this mortality is high, but it is well shown that the cause is incompetent medical attendance, for maternal mortality is higher when the patients are attended by physicians than when they are attended by midwives. Indeed, Dr. William Nicholson of Philadelphia recently gave me statistics for the cases controlled by midwives in his district, which he was afraid to publish—twenty deaths in sixty thousand cases.

I have spoken of the personal responsibility for infection. To those who were willing to accept this theory, the question of prophylaxis loomed large; and the introduction of rubber gloves undoubtedly helped materially in decreasing the number of infections, and particularly those dying as a result of infection. There remained, however, a certain number of infected cases, where gloves had been worn, and even where no vaginal examination had been made, which required explanation; for over twenty years I have used gloves for all examinations and, strange to say, my one patient who died of infection after confinement had not been examined or handled in any way. Our results in the Montreal Maternity since we have adopted the uniform practice of examining by the rectum seem to offer a possible explanation. At first sight assuming that the vagina contained no virulent pathogenic organisms, it would appear that rectal examination should be devoid of danger; yet, I think I am right in stating that, since the introduction of rectal examination into the clinic, the number of mild infections has increased to an extent greater than the number of severe infections has been lessened. No one ever denied the presence of organisms in the vagina, capable of growing on dead tissue. To produce puerperal fever, however, it is necessary, firstly that they should be introduced into the cervical canal; and secondly, that the membranes and clots left behind in the uterus should offer a medium for their growth. The assumption of the harmlessness of the rectal examination has resulted in its too frequent use. It is impossible to palpate the cervix through the rectum without folding the posterior vaginal wall into the cervical canal, so that more vaginal organisms gain entry into the cervix during rectal examination than during vaginal examination. Then, too, this entry of vaginal organisms is favoured by the too frequent active massaging of the fundus of the uterus during the third stage, when it is evident that portions of the ruptured membranes must also lie in the vaginal canal. Further, this massage of the uterus frequently partially separates the placenta and allows bleeding, which is difficult to control and which almost inevitably results in the formation of clots in the uterine cavity. It would appear, then, that rectal examination, like vaginal examination, might come under the old heading "meddlesome midwifery." There can be no doubt that rectal examination is a distinct advance on vaginal examination; but I would insist that it is not free from certain of the dangers associated with any intra-partum examination. I might add that the infections after rectal examination are mild, and are of a nature which we are pleased to term sapraemia; in other words, the fever is due to the absorption of the toxins produced by the development of bacteria in dead tissues, as opposed to the more severe puerperal infections caused by the pyogenic organisms. The mildness of the infection has had a certain effect in altering our methods of treatment; since, when the infection is obviously mild, there is less tendency to interfere within the uterine cavity. It has taken a long time to establish the fact that it is unsafe to attack infections from behind; and yet, these mild infections are probably the ones which would have yielded most satisfactorily to intrauterine therapy, with resultant evacuation of the dead tissue on which the organisms were growing. Nevertheless, the indication for treatment has seemed more and more a stimulation of the resistance of the patient to whatever organisms might be invading; and the most satisfactory new method which we have introduced recently in the treatment of puerperal and post-abortion fever has been the injection either of raw blood or sterile milk for the production of the so-called "non-specific protein reaction." It is not my purpose to go into the question of protein reactions-you will find a report by Gellhorn at the last meeting of the American Gynecological Society, and an extensive review of an article by Soli in Surgery, Gynecology and Obstetrics for July, 1924—but in a general way the introduction of any foreign protein seems to stimulate resistance of the body generally; and the agents most frequently employed have been milk and blood. The advantage of blood is that it is easily obtained sterile, and when given hypodermically there is no need for the same care in grouping as when the patient is transfused. We are all familiar with the immediate effect of blood injection in haemorrhage of the newborn; and the result of blood injections in mild infections is quite as striking.

Birth traumata may be classified as follows: damage to the birth canal and subsequent alteration in position of the organs, which in the last degree may result in complete hernia of the uterus; damage to the cervix, with eversion of the mucosa, and leucorrhoea; damage to the structures at the base of the bladder, with cystocele. Backward displacement of the uterus, relaxation of the pelvic floor, and prolapse are interdependent, and liable to be stages in the one process. The simplest of all, the everted laceration of the cervix has, probably, the simplest explanation; during labour the lower uterine segment tears at the slightest touch, and in a great percentage of even spontaneous labours, there is more or less laceration, extending up from the margin of the dilated cervix. This laceration will heal if it is allowed to do so, but anything that tends to backward displacement of the fundus, such as over-distension of the bladder or the application of a tight binder immediately after delivery, tends to hold open the laceration, and allows the formation of scar tissue in its upper angle, with resultant permanent opening of the cervix and permanent tendency to backward displacement. This is not purely speculative, for coming from a clinic where no binders were used to one where patients were bound tightly after delivery, I found, to my surprise, that backward displacements were many times more frequent in those bound than in those left unbound after delivery; and it was by the goodwill of Dr. D. J. Evans that we were enabled to run two series of cases side by side, and test the importance of the binder in the production of the abnormal condition; as the result the binder has now been disearded.

To estimate the permanent damage to the perineum was rather more difficult. With great care the mucosa and skin could be saved in many instances, no tear was noted; only, some months later it became evident that there had been subcutaneous damage to the muscle or fascia. Mathematically, it was possible to prove that, while women with an average sized pelvic outlet might escape damage to the perineum, there were certain cases in which, during delivery, the head must pass entirely behind a line joining the two tuberosities. In

such patients it was impossible to avoid extensive lacerations, often involving the bowel. Moreover, the cases coming to the gynecological clinics, complaining of incomplete sphineter control, were found practically invariably to be women with a male type of pelvis, narrow sub-pubic angle and a very short distance between the tuberosities of the ischium.

Now if all these cases with a narrow outlet were certain to be damaged, it was but a short step to the conception that an incised wound was better than a ragged tear, and since 1906, median episiotomy has been practised more or less frequently; indeed, since 1914 it has become practically routine with all primiparae; for not only was it found that an incised wound helped in the narrow outlets, but that any rigid perineum forced the head forward in the pelvis, and that a long perineal stage seemed to increase the damage to the fascia at the base of the bladder, with resultant cysto-Median episiotomy has been subjected to criticism, as leading often to damage of the sphincter. Possibly, familiarity with this accident has lead me to minimize its importance; but a median incision in the perineum, whether involving the sphincter or no, is extremely easy to repair and rarely fails to unite by first intention.

In the discussions of uterine displacement, the condition of the abdominal wall must be considered. Pendulous belly is a forerunner of many distressing gynecological complaints, often associated with dragging pain in the back. Care of the abdominal wall is indicated first in pregnancy, when massage will do much to keep the muscles in condition; but also it should be remembered that the maximum strain on the abdominal wall occurs in the second stage of labour, when the muscles of this wall are put in opposition to the resistance of the pelvis or pelvic floor. It is not my purpose to discuss with you in how far the abdominal muscles should be aided when the patient is well advanced in the second stage. It may be stated that when the repairable damage, inevitable with the use of instruments, is less than the irreparable damage subsequent to a hopedfor spontaneous termination, the patient should be delivered; not only on account of the mother but because we now know that a prolonged second stage has worse consequences so far as the child is concerned than a properly conducted artificial delivery. Reference has frequently been made to the second stage. I hope it is understood that during the first stage of labour, there is absolutely no indication for interference, save for the purpose of saving life. Although the first stage pains are frequently nagging in character, and often more objectionable than the more severe pains of the second stage, even the most ardent advocates of the so-called "twilight sleep" do not suggest the induction of twilight sleep until the first stage is well advanced; and we have found that the judicious use of heroin not only relieves pain in the first stage, but has no effect in decreasing the force of the uterine contractions. No other measure has helped more in the handling of nervous, high-strung patients than the judicious administration of heroin.

The combined effect of these suggestions in the management of labour should be, so far as the mother is concerned, to leave her practically in the same physical condition as she was before she became pregnant. De Lee of Chicago goes so far as to say that, with proper obstetrics, there should be no clinical multiparae. Certainly, these patients, managed as I have suggested above, show in subsequent labours the same descent of the head into the pelvis as the primipara, and bring to the second stage of labour, thanks to the usually short normal first stage, a mental and physical attitude which, surprising as it may seem, nearly always results in spontaneous delivery with comparatively little damage to the soft parts.

Heis's statistics from the Vienna clinic (reviewed in the July number of Surgery, Gynecology and Obstetrics) the largest practically available, give 3.6% as the death rate for infants up to and including the eighth day, not including, of course, those born dead, in 88% of whom death takes place during labour. Let it be remembered that long tedious labours are more dangerous for the child than the carefully performed operations. Last year at the Canadian Medical Association I was able to present my results in the delivery of primiparae, over one-half of which had been delivered instrumentally. The foetal results were better than could possibly have been obtained in socalled spontaneous labours. It is the custom

to decry operative delivery, yet my experience is that the men who talk conservatism do not invariably practise it; and that much adverse comment is due to observing the other man's unfortunate results. It has been well said, that it is not the advocate of any new measure who does harm, but rather his incompetent imitators. I doubt whether any one would wish to follow Potter of Buffalo, with his nine hundred versions in a year's practice, yet there is no doubt that the obstetric world owes Potter a debt for the rehabilitation of version and certain improvements suggested in the technique of the operation. The prophylactic forceps operation of DeLee, which has also come in for considerable unfavourable comment, is but a step from our own episiotomy; and my own practice is to deliver a great many of my primiparae with forceps. This apparently radical attitude to delivery is, to my mind, the greatest safeguard against the real radicalism of to-day, the too frequent employment of Caesarean section. Caesarean section is so simple, and still so spectacular, that even untrained surgeons have no scruples about its employment, and are too often aided by the willingness of the patient, who is anxious to escape pain, and by her immediate friends, who are anxious to have something to talk about. It is questionable whether the broadening of the indications for Ceasarean section has markedly improved its foetal results; and there is no doubt that an appalling maternity mortality is, for the most part, ignored. The tendency to invariably use it in all cases of placenta praevia and profound toxaemias does nothing but harm to the advancement of straight obstetrics. Prof. Newell, of Harvard, says: "Conditions in Boston are not perfectly satisfactory, owing largely to the fact, in my opinion, that a considerable proportion of the obstetric consultation is done by the younger surgeons who have had no obstetric training, and whose one idea in delivery is to do a Caesarean section, irrespective of the conditions present." Anyone can deliver a patient by Caesarean section, but judgment may be required to safeguard a mother against treatment which will sacrifice her in the interest of the child. Good judgment can only be the result of extensive experience; and the experience is but slowly acquired after a physician has entered private practice.

What is the outlook for improvement? What has been done, and what remains to be done? Your answer will, no doubt, be "We have improved prenatal care." Yes, we have scared patients from the clinic by taking routine Wassermanns even in cases where lues was not suspected, with uncertainty whether the Wassermann itself was reliable during pregnancy. We have, to a certain extent, impressed upon the patients that pregnancy was a pathological rather than a physiological condition. We have taught them to look for trouble, rather than to recognize and avoid it. Certainly, prenatal care has not benefitted fever statistics; and haemorrhage, another possible cause of trouble at the time of labour, is but little affected. True, we have discovered a certain number of cases of pyelitis, and the necessity for frequent urine examination has been emphasized. That this last is important is borne out by the fact that toxaemia of pregnancy ranks first as a cause of death under labour; and DeLee's statement that he has, by proper pre-natal care, eliminated eclampsia is no mean achievement. Yet ante-partum care is no substitute for intra-partum and postpartum care. Obstetric follow-up is, so far as I know, unknown in Canada; and the importance of toxaemia in one pregnancy as a factor in influencing further pregnancies has recently been investigated for the first time by Harris of Johns Hopkins. True, we have for some time past been increasing the number of Caesarean sections upon patients with evidence of chronic kidney disease, believing that each pregnancy further damaged the kidneys, and that the symptoms of toxaemia would appear earlier, and believing that section gave the most satisfactory means of delivery of an undamaged, premature child. For the first time we have statistics to back our clinical inference.

In my opinion, all this extensive prenatal care, without improvement in practical obstetries at the time of delivery, is comparable to an attempt to improve a crop yield, with utter disregard of the most extravagant and wasteful methods at the time of reaping. Prenatal care is hopeless without some improvement in the teaching and practice of obstetrics. The most recent graduate under the most favourable conditions is not qualified to undertake the management of any but the simplest obstetrical cases, any more than to indulge in the practice of abdominal surgery. The public is sufficiently well educated to know that surgery requires special training and experience after graduation. Such is not the case in regard to obstetrics; but, the public is waking up. There is only one solution; the better training of all students, which will enable them to recognize difficulties and dangers; and special training of certain men, who, in large centres, shall do consultation work and institutional work, possibly under government control.

The admission to the country of new citizens of good national stock is more important than the admission of any class of continental immigrant, and if this were properly appreciated it is doubtful whether the native born would be as willing to leave his native land and accept citizenship across the line; yet, I doubt if any government has ever given a cent toward improving the quality and increasing the number of its citizens by improvement in obstetrical practice. I am not a prophet-but it is coming—the association of obstetrical clinics with large general hospitals where special attention may be directed toward the causes of toxaemia; where it may be possible to investigate more carefully the organisms associated with the varieties of puerperal infections, and finally where it will be possible to put the control of obstetrics on the same basis as medicine and surgery; all steps in advance, which must lead to the placing of obstetrics in a higher position both with the public and with the profession.

The Presence of Hymenolepis Nana in Porto Rico.—In examining the forty-seven inmates of the boys' orphan home in Hatillo, Porto Rico, for hookworms, the eggs of Hymenolepis nana were discovered by Rolla B. Hill and

Augustin Sanchez, San Juan, Porto Rico, in the stools of three of the boys. While this parasite has not been reported before from Porto Rico, it seems clear that it has gained a foothold in the island.—Jour. Am. Med. Ass., Sept. 6, 1924.

HAEMATURIA

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To enumerate the causes of haematuria is to make a list of the diseases of the urinary tract. There are, however, certain diseases of the urinary organs in which haematuria is the most characteristic symptom. Thus in new growths of the kidney and bladder and stone in any part of the urinary tract haematuria is the cardinal symptom and the absence of haematuria raises a doubt as to the presence of these diseases.

We are accustomed clinically to class cases of haematuria into:—(1) Haematuria with localizing symptoms; (2) Haematuria without localizing symptoms.

The localizing symptoms are:—(1) Pain and tenderness; (2) Frequency and difficulty of micturition; (3) Enlargement of the kidney and prostate; (4) Thickening of the bladder wall as felt from the abdomen, rectum or vagina; (5) Enlargement of glands in the lymphatic tract of the bladder as felt by the rectum; (6) Thickening of the ureter.

There are certain cases of difficulty:—(1) When the symptoms accompanying haematuria are misleading for the purpose of localization; (2) When haematuria is the chief symptom of a disease in which it is usually slight or absent; (3) In the diagnosis of intermittent renal haematuria.

It is to such difficult cases that I shall devote the time you have allotted to me in this discussion.

1.—Haematuria with misleading symptoms.

—Aching pain in the kidney region on the side in which a papilloma of the bladder lies, is I think, now well recognized. This pain is not a severe pain; it amounts only to a dull ache, and is no doubt due to a minor degree of obstruction produced by the papilloma lying at the orifice of the ureter. In a case of intermittent haematuria without other symptoms a slight persistent aching in the kidney may be easily taken as a localizing symptom. Some years ago, when the cystoscope was not as

generally used, it was not uncommon to find a patient with papilloma of the bladder and the scar of a previous kidney exploration on the same side as the papilloma.

There are some cases of renal tuberculosis where there is an early attack of haematuria. In such cases the frequent micturition which invariably accompanies renal tuberculosis may act at first as a misleading symptom in the localization of this disease.

It is not often one meets so complicated a case as the following:—

G. E. W. a vigorous man, 66 years of age, gave a history of one attack of haematuria with some difficulty of micturition in 1913. This recurred in August, 1916, and again twice between that time and October, 1916, when I examined him. He was sent to me on account of urgency and frequency of micturition. The frequency amounted to three times during the day and twice at night, and there was delay in starting and a poor stream. On examination the prostate was enlarged, elastic, and movable. In the right loin there was a very prominent large mass passing upwards under the costal margin and downwards almost to the iliac crest and well below the umbilicus and as far as the mid-line of the abdomen. The mass was partly resonant and was movable and had a smooth surface and elastic consistence. There had been no pain in the lumbar region and no tenderness was present.

An x-ray examination showed stone shadows in his bladder area and at the lower end of the right ureter. The view I first formed was that this was a malignant growth of the kidney, and simple enlargement of the prostate. With the discovery of the stone shadows, it appeared more probable that this renal condition was a hydronephrosis of slow development due to the obstruction of the ureteral calculus.

I operated in November, 1916, and removed several stones from the bladder and an adenomatous prostate. An attempt to remove the

stone in the lower end of his ureter failed owing to the dense adhesions and condition of the patient. I took the opportunity of opening his peritoneum and palpating his enlarged kidney. The kidney was cystic to the touch, but was firmly fixed in the loin. The patient progressed favourably for 14 days when there was a sudden rise of temperature and some pain in his right loin. I thereupon drained the right kidney and found a large, multilocular cyst. A very large quantity of brownish semi-solid material escaped, the appearance of which once more raised the question of growth. The pathologist reported that this material consisted of shreds of granulation tissue, necrotic tissue, pus and blood. The renal fistula closed. but the kidney remained large.

In June, 1917, I removed a large, densely adherent kidney, the seat of an adeno-carcinomatous growth. There was considerable necrosis and free haemorrhage from cyst-like cavities. The patient made a good recovery and is alive and active to-day.

2.—I will now pass to the second class of cases, viz. those where haematuria is the prominent or the only symptom in a disease where it is usually absent. It is very rare that haemorrhage is the only symptom of a serious urinary infection. Such a case is certain to be misleading if the surgeon does not recognize the possibility. The following is a case of severe symptomless haematuria due to pyelitis.

A lady, G. F., age 30, was seen by me in November, 1918, and gave the following history:-Two days previously she had a chill and dark blood appeared in the urine. The haematuria continued and there was some pain in the bladder from passing clots. There was no increased frequency of micturition, and no urgency, no real pain and the temperature was normal. On examination there was no tenderness, no enlargement of the kidneys. urine was thick with dark blood and I could detect a faint offensive odor. I gave my opinion that this case was one of acute infection in an early stage. The bacteriologist reported that the urine contained a pure culture of Bacillus coli. The haemorrhage continued for a week and then ceased. On cystoscopy the bladder held 10 ozs. of fluid and found the surface of the mucous membrane healthy. There was a pronounced degree of trigonitis,

but the ureteric orifices were healthy. Catheterization of the ureters showed that the urine from the right renal pelvis was free from bacteria and contained no pus. The urine from the left renal pelvis contained a large number of bacteria, gave a pure culture of Bacillus coli. A later history of this ease was that of recurrent attacks of left pyelitis, but there was never any pronounced pain in the kidney region. Severe haematuria may also be an early symptom of acute cystitis appearing before frequent micturition sets in.

3.—The third type of haematuria to which I wish to refer is intermittent renal haematuria without other symptoms. The attacks of haematuria recur at long intervals and the case is presented to the surgeon at a time when the haemorrhage has ceased. Cystoscopy reveals no disease in the bladder. This form of haematuria may give rise to great difficulty in diagnosis.

Minor changes at one of the ureteric orifices may be misleading. A gaping ureteric orifice may be of a temporarily functional change unconnected with disease. An appearance of slight puffiness of the ureteric lips may only mean bad focusing. Pronounced changes such as inflammation or oedema have a definitely localizing value.

Chromo-cystoscopy by the intra-muscular or intra-venous injection of indigo carmine may show a diminished function of one kidney by the efflux being less deeply stained on one side. In my experience this sign is unreliable.

Slight variations of the function as shown by indigo carmine excretion are of comparatively frequent occurrence in normal kidneys, and moreover the causes of intermittent renal haematuria in the early stage of their development do not impair the renal function, nor does one find changes in the urea content of the urine so pronounced as to give reliable information in most of these cases. If, however, in a number of examinations by different tests of the renal function performed at intervals there is a persistent reduction in the renal function, this may be regarded as a sufficient localizing sign for operation.

The x-rays may show a quiescent stone or may give an indication as to the side of the disease by demonstrating enlargement of the renal shadow. But this is not always a reliable sign. Thickening of the perinephritic fat from an old appendicitis or other retro-peritoneal inflammation without renal disease may give an enlarged renal shadow. Usually when the kidney is sufficiently enlarged to throw an increased shadow, it is also palpable as an enlarged organ. The injection of oxygen in the peri-nephritic space as an aid to radiography of the kidney presents some technical difficulties, but there are cases where this method of examination gives very useful information.

Pyelography is said by Braasch to give definite information in regard to distortion of the renal pelvis in 75% of all cases of renal growth. I have not been able to confirm this observation. Some of the appearances described by Dr. Braasch can be reproduced by variations in the filling of a normal pelvis. Occasionally, however, one obtains really useful information in regard to distortion of the renal pelvis in a case of intermittent symptomless haematuria.

Catheterization of the ureters sometimes provides an unexpected localizing sign by causing a severe temporary haemorrhage. I do not refer to the small quantity of bright blood that often appears in the urine drawn by the ureteric catheter a few minutes after the catheter has been introduced. The bleeding is never severe and it appears only after the catheter has been in the urine for several minutes. The haemorrhage to which I refer is a copious haemorrhage appearing immediately on the passage of the catheter. The blood is dark in colour. This sign is so characteristic of renal growth as to warrant exploration of the kidney on the bleeding side.

Occasionally suspicious cells or tiny fragments of growth are found in the urine. If these are present catheterization of the ureters and examination of the specimens of urine obtained will show which side is the seat of disease.

In the following case the presence of fatty cells in the urine of one kidney decided me to operate on the kidney, in spite of the fact that there was pain in the other renal area, and a urinary surgeon had reported a gaping and slightly puffy ureteric orifice on the other side.

J. C., male, age 58, gave a history that in March, 1920, he had a severe attack of symptomless haematuria without any exciting cause. The bleeding lasted 5 days and then disappeared. In July, 1920, there was a recurrence of the haematuria lasting three days. He was cystoscoped by a urinary surgeon who found the urine clear and the bladder healthy. This surgeon stated that the right ureteric orifice was larger than normal and the trigone on this side was slightly oedematous. There had been some pain on the right side of the abdomen which raised the question of appendicitis. The pain became localized to the right renal region and was considered by the medical attendant to be definitely renal. When I examined him there was discomfort in the right loin. The abdomen was full and there was no enlargement or tenderness of either kidney. The urine reported on November 22nd, 1920, contained a fair amount of blood, a small number of leucocytes and a considerable number, of epithelial cells. These were both small and large and showed granular and fatty degeneration. No large groups or clumps were seen. The specimen of urine contained by catheterization of the ureters November 24th, 1920, gave the following report:—Left kidney.—the urine contained a fair amount of blood with a number of free epithelial cells, but no pus. Some of the epithelial cells show fatty degeneration as in the bladder urine. Urea 1.0 per cent. Right kidney.—The urine contained a very small number of hyaline easts, and a very few blood cells. There is a slight excess of large transitional epithelial, but no abnormal cells were found. Urea 1.4 per cent.

I explored and found a large malignant growth of the left kidney projecting into the renal pelvis. There were enlarged glands in the renal pedicle and along the aorta above this. Nephrectomy was performed.. Death took place some months later from secondary deposits in the liver and lymphatic glands.

If I might give advice to those in general practice in regard to haematuria it would be as follows:—Haematuria is a symptom, not a disease, and the cessation of the haematuria is not a cure of a disease. Every case of haematuria should be followed to a definite diagnosis, using if necessary all the resources of modern surgery. Cases of haematuria should be submitted to cystoscopy during an attack of haematuria so that if the haematuria has a renal source the side from which it comes may be discovered.

TUBERCULOSIS AND CALCIFICATION OF PROSTATE REPORT OF A CASE

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DEPOSITION of calcium salts in the form of concretions or calculi in the prostate gland is a finding, to-day, not uncommon in the practice of urologic surgery. These bodies occur in the prostate usually small and multiple and frequently give no sign of their presence; less often they are found singly and more or less large and are at times silent also.

Kretschmer in 1918 exhaustively reviewed the literature and reported cases of true prostatic calculi. We propose in this article to report a case in which nature attempted to effect, more or less successfully, a cure by means of the deposition of calcium salts in a prostate, doubtless the seat of disease.

Case No. 1279.-W. S., male, aged 53 years, married, ex-soldier. Admitted to hospital October 17th, 1919. Discharged December 19th, 1919. Complaints:—(1) Swelling of left scrotum; (2) Urethral discharge. (1) November, 1917; (2) July, 1919.

History of Present Illness .- In Nevember, 1916, while in the Canadian Army in England, patient experienced after hard work, a sudden acute swelling of the left No previous swelling in either scrotal sac. Sent to hospital; swelling subsided. Shortly after the right scrotum became involved, then alternately the right and left sides flared up. Three months later the right side became greatly enlarged, hot, tender, inflamed and broke down spontaneously, discharging pus for six months from several sinuses, finally healing. On discharge from the army in December, 1918, the right side had completely subsided, but the left was enlarged and moderately painful. In the summer of 1919, he was admitted to a military hospital with pain and swelling in the left scrotum, associated with fever. In July, 1919, he developed an urethral discharge which was intermittent. There was no painful urination, no haematuria, no difficulty in voiding, no noticeable alteration of the urinary stream and no frequency of urination. Patient was admitted to the Royal Victoria Hospital with a septic temperature.

Family History.- Negative. Personal History.—Denied venereal disease; married; wife in good health; three children, alive and well.

Physical examination.-The general examination revealed no lesions.

Genito-Urinary System.-Kidneys not palpable. costo-lumbar tenderness either loin. Bladder not dis-tended—no suprapubic tenderness. Penis normal to tended—no suprapubic tenderness. Penis normal to inspection. Urethral meatus not inflamed; shows a thick yellowish discharge, not constant. A No. 16 soft rubber

catheter meets obstruction in the prostatic urethra. Sounds F22 and F24 are likewise obstructed. A filiform bougie was passed easily to the bladder-no gripping on Scrotum on the right shows two healed withdrawal. scars near the median line; these are adherent to the right epididymis which is hardened and nodular. Scrotum on the left is enlarged, red, hot, tense and tender. On the antero-lateral aspect in the upper portion is an area of tenderness and fluctuation-epididymitis with abscess. Prostate, by rectal examination, is small, very hard, not tender or fixed, no fluctuation. Urinalysis: -On repeated examinations showed traces of albumin. Microscopically pus + to pus +++ Smears of wrethral discharge: showed pus, no gonococci, no acid-fast bacilli or other organisms. Wassermann reaction on blood: negative. Skiagraph of kidneys and bladder: - Showed a dense ovoid shadow much suggesting the size and contour of a normal prostate and about the size of a small hen's egg, lying in a horizontal position, just behind the symphysis pubis.



FIG. I.

Course.—The patient ran a septic temperature until the abscess in the epididymis was incised. Later a complete extirpation of the left epididymis and testicle was performed. Complete recovery.

Pathological diagnosis of this specimen.—Tubercu-

losis of epididymis and testis, left.

Under gas and oxygen anaesthesia suprapubic removal of the prostatic calculus was performed with some difficulty. No glandular tissue of the prostate was found. The patient made an uneventful recovery.

The calculus was single and on removal measured 1 11/16 x 1 6/16 x 3/4 inches. It weighed in the fresh condition 26 grammes.

The size and shape of the specimen suggest very strongly that of the adult normal prostate gland. The outer surface is white, hard, and presents a pebbled appearance. The cut section shows a central portion made up of many small concretions set in a porous frame-work of the same consistency as the concretions, and an outer portion showing several layers of more or less hard calcareous material.

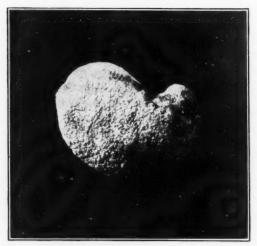


Fig. II

Chemical analysis of the specimen:-

Total amount of organic matter46.686% Total amount of inorganic salts53.314%

 $\begin{array}{ccccc} Constitution & of & the & inorganic & salts:-\\ Ca_3 & (Po_4)2 -\!\!-\! 30.387\% \; ; & Mg_3 & (Po_4)2 -\!\!-\! 20.477\% \; ; \\ Na_3 & Po_4 -\!\!-\! 2.101\% \; ; & T_{13} & Po_4 -\!\!-\! 0.349\% \; . \end{array}$

The organic matter consisted of protein and nucleo-protein and organic phosphorous compounds such as lecithin, etc. The inorganic and organic constituents were not uniformly distributed in the calculus. The organic were found chiefly in the central part while the inorganic were chiefly localized in the peripheral portions. There were no chlorides or sulphites in the calculus. Calcium and magnesium phosphates are derived from the secretions of the prostate. In human semen, however, the calcium is to the magnesium as 100 is to 34.53; whereas in the calculus it is as 100 is to 48.23.

In the literature the only case found to somewhat resemble the case being reported was that of Bence-Jones in 1855. His case was one in which there were ten calculi, facetted with the

facets highly polished. When each stone was placed in its proper facet the whole made a structure much resembling the shape and size of the prostate gland. These calculi were found at autopsy in a case with active pulmonary tuberculosis, and stricture of anterior urethra. Analysis of the stone showed predominance of calcium carbonate and phosphate.

The chemical analysis of the specimen from the present case shows several interesting and significant facts. The inorganic salts present form only slightly more than one-half of the constituents of the specimen. These salts are made up entirely of phosphates of calcium magnesium, sodium and potassium. It is seen that the phosphates of calcium and magnesium are the chief ones concerned. According to Macallum they are found as normal chemical constituents of prostatic fluid in the proportion, approximately of three of calcium to one of magnesium. In the specimen the proportion, approximately, is two of calcium to one of magnesium. Lassaigne quoted by Kretschmer gives the content of inorganic salts in primary prostatic calculi as 85% and that of the organic matter as 15%. Kretschmer in the published analyses of stones removed by him gives only traces of organic matter with the predominating salt calcium oxalate.

Perhaps the most significant finding in the analysis is the unusually high organic content of the specimen—nearly one-half. This consisted chiefly of proteins and nucleo-proteins in the form of organic phosphorus compounds such as lecithin, normal chemical constituents of prostatic fluid.

Diagnosis of the case was made by means of routine examination including the x-ray. The roentgenographic findings of the case are unusual. In true prostatic calculi the shadows according to Forssell (quoted by Kretschmer) are of two types: One in which the shadows are small and are arranged symmetrically in small groups near the midline. The other are shadows packed closely together and lying symmetrically on both sides of the midline. These shadows are seen to lie just above the symphysis which fact to the uninitiated might easily lead to a diagnosis of vesical calculi.

Here the roentgenogram shows a large, dense shadow, taking the shape more or less of a normal prostate, just behind the symphysis. It seems as though one were looking through the pubic bones at the calculus.



Fig. III.

The question of a probability of a pre-existing tuberculosis of the prostate arises. The case at the time of admission to the hospital had an epididymitis on the left. The epididymis and testicle were extirpated and found to be definitely tuberculous. The right epididymis gave evidence of having been likewise infected. So distinguished an authority as Keyes has stated that in his belief when one epididymis is infected, the prostate as well is likely

also infected; and when both are involved the prostate almost certainly is infected as it forms the bridge for infection to pass from one side to the other.

The facts which lead us to believe that we have here to deal with a calcification of the prostate are:—

- (1) The size and shape of the calculus.
- (2) The lack of any glandular tissue of the prostate.
 - (3) The unusual roentgenographic findings.
- (4) The large proportion of organic material in the chemical analysis of the specimen.
- (5) The presence of calcium and magnesium phosphates in almost the same ratio as they are found in normal prostatic fluid.
- (6) The history and physical findings, which lead us to consider that the prostate had at one time been the seat of an infection, likely of tuberculous etiology.

In conclusion we wish to extend our thanks to Dr. A. B. Macallum of the Department of Biochemistry, McGill University for the extensive analysis of the specimen, thereby making possible the publication of the paper.

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The Appendix in Relation to or as the Cause of other Abdominal Diseases.—Charles H. Mayo, Rochester, Minn., is convinced that the appendix undoubtedly is the source of chronic infection in the upper abdomen, and, as a rule, should be examined and removed during operation on the gallbladder or on ulcers of the stomach or duodenum. If, in examination of the abdomen before operation for pathologic conditions other than appendicitis, the appendix is found to be much more seriously diseased than the symptoms had indicated, or if in operations on the chronic diseased appendix the condition is found to be much more extensive and serious than was expected from the symptoms, the appendix should be con-

sidered a possible focus of disease involving the upper abdomen, and the exploration should be extended to this region by increasing the length of the incision, which is possible if it is a right median rectus incision. So far as the patient is concerned, if he is chronically sick from gastric trouble with pyloric spasm, even if it is the result of reflex action from disease of the gallbladder or appendix, he is entitled to relief and the greatest degree of permanent relief is usually best attained by surgery. If operation fails to confirm supposed disease of the gallbladder or ulcers of the stomach or duodenum, the appendix should be examined, as it may be the offender.—Jour. Am. Med. Ass., Aug. 24, 1924.

OBSERVATIONS ON THE UREA CONCENTRATION FACTOR IN THE ESTIMATION OF RENAL EFFICIENCY*

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IN a comparative study of the various renal efficiency tests¹ it was shown that in renal lesions associated with azotaemia or any other evidence of impairment in excretion of nitrogenous stubstances, the "urea concentration factor" appeared to be a more sensitive index of kidney function than the other tests in general use.

The following is, briefly, the routine of the test: The patient is allowed no food nor fluids of any kind after 6.00 p.m. the evening before the test. At 6.00 a.m. the day of the test the patient voids. This specimen is discarded. The patient is then given 15 grams of urea dissolved in 150 c.c. of water flavoured with lemon juice. The blood is collected two hours after, and the urine one and two hours after the ingestion of the urea. The value of the factor is obtained as follows:

Factor milligrams urea per 100 c.c. blood.

It appears searcely necessary to reiterate that only by performing the test under the standard set of conditions described can the results be of real clinical value. The average normal value was found to be 40.

Since then an attempt has been made to measure, quantitatively, the efficiency of the kidneys—at least in so far as the excretion of urea is concerned—by the application of well recognized thermodynamic laws². The "urea concentration factor" forms an essential part of this procedure. For theoretical purposes, as described, it was necessary to slightly modify the routine and calculation of the factor. This consisted in dividing the concentration of the urine urea, by the arithmetical mean concentration of the blood urea obtained both before and two hours after the ingestion of the urea. Thus:

*From the Department of Metabolism, Montreal General Hospital.

This increases the value of the factor from 40 to 50 for normal individuals.

In estimating renal efficiency by means of this factor it is obviously to be desired that the value of the maximum concentration of urea by the kidneys to be found, otherwise the working capacity is not fully reflected by the figure obtained. Occasionally, as observed by Harrison³ the maximum concentration of urea in the urine may be noted to occur at the end of the first instead of at the end of the second hour after the administration of urea. If this fact is not recognized, factors lower than the accepted normal may be obtained in normal individuals. To determine the incidence of this phenomenon, one hundred consecutive cases were studied in the following manner:

The blood and urine specimen were collected before, one and two hours after the administration of urea. It was thus possible to obtain two factors (a) at the end of two hours and (b) at the end of one hour. Thus:

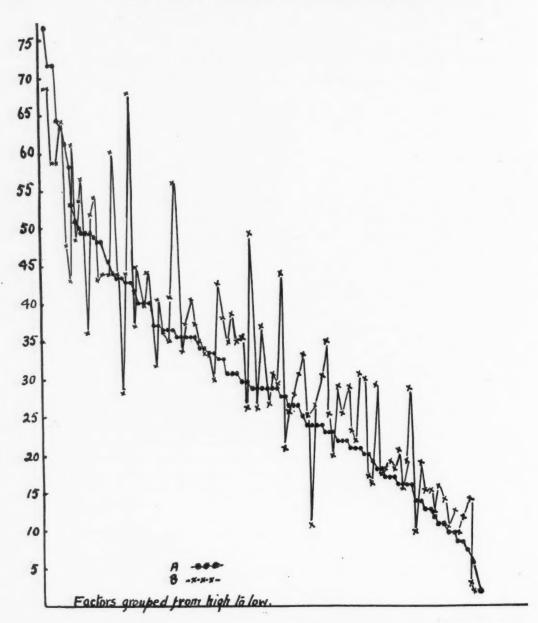
$$Factor A = \frac{U_1}{\left\{ \frac{B_1 + B_3}{2} \right\}}$$

$$U_2$$

$$Factor B = \frac{U_2}{\left\{ \frac{B_1 + B_2}{2} \right\}}$$

WHERE U₁=conc. of urine urea at end of first hour U₂=conc. of urine urea at end of second hour B₁=conc. of blood urea before administration of urea.

 B_2 =cone. of blood urea at end of first hour B_3 =cone. of blood urea at end of second hour



For brevity, the data obtained are not recorded in detail. The appended chart is a graphic representation of the results, with the factors A and B recorded in the ordinates from highest to lowest values. The dotted line represents factors A, and the crossed line represents factor B. It will at once be observed that with few exceptions the maximum value

for the factor will be obtained by the method in use, that is, factor A.

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SOME POINTS IN TREATMENT OF BREAST CANCER*

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THE symposium on the treatment of breast cancer was opened by a paper by Dr. Etherington, of Kingston. As his paper appears in full in the August number of the Canadian Practitioner, it is unnecessary for this Journal to publish it, but we present our readers with an abstract of it.

At the outset he states that the results obtained in the treatment of this grave disorder leave much to be desired. Two reasons for this have to be recognized. The first is the fact that in many cases the family physician is only informed of the presence of a lump in the breast when too late, and after the disease has become so extensive that operation would only be of slight benefit as complete removal of the disease is impossible. In another class of case the malignant character of the disease is not recognized and an insufficient operation converts the case from a hopeful to a hopeless one. In all tumours of the breast it is well to reverse the common legal maxim and hold all guilty until proven innocent. In some cases one has also to recognize the fact that cases of simple chronic mastitis may become malignant. Under no circumstances should a surgeon wait for the appearance of the classical

signs of carcinoma, namely, fixation of the tumour, infiltration of the overlying skin, retraction or discharge from the nipple and enlargement of the adjacent glands. In every case the surgeon should proceed to ascertain beyond peradventure the exact pathological condition present, and should at once proceed to carry out appropriate treatment. If he does not feel competent to make a diagnosis on gross section he should have with him, as a member of his team, a pathologist who will be able in a few minutes to give an accurate finding from a frozen section. It must be recognized, however, that no surgeon or pathologist even with the maximum of experience can always distinguish malignant from benign neoplasms. In these cases it is important that he play for safety. Because the mass is small and perhaps apparently local there should be no curtailing the extent of the operation. Dr. Etherington in closing, emphasied the advantage in his opinion of the use of radium as a beneficial adjunct after operation and quotes Handley as follows, "with all its limitations radium has secured a definite position in the treatment of breast cancer. It relieves or postpones pain and disability, prolongs life and sometimes substitutes a painless exitus due to internal recurrences. In a case of single recurrence it may possibly complete the cure of the disease."

Tuberculous Peritonitis and Disseminated Carcinoma of the Peritoneum.—In two cases of diffuse carcinoma of the peritoneum which came to necropsy, tuberculous peritonitis was the clinical diagnosis, and this was confirmed by a pathologic report on a section of omentum, removed in one case during laparotomy. Russell S. Boles, Philadelphia, is of the opinion that the determination of the existence of a primary focus of tuberculosis should not pre-

clude the possibility of careinoma existing in the peritoneum. Since the symptoms and physical findings may be strikingly similar in tuberculous peritonitis and careinoma of the peritoneum, a painstaking consideration of the differential features is essential. Heliotherapy is an excellent therapeutic test of the diagnosis of tuberculous peritonitis, since it produces definite improvement in the majority of cases.—

Jour. Am. Med. Ass., June 28, 1924.

^{*}Abstract of paper read as contribution to the symposium on Chronic Lesions of the Breast, at the Canadian Medical Association Meeting, Ottawa, 1924.

SURGICAL TREATMENT OF CHRONIC LESIONS OF THE BREAST*

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IN this discussion of the subject of Chronic Lesions of the Breast Dr. Graham has presented the pathology; Dr. Etherington has stressed the importance of early diagnosis and management; and there remains for me but to point the moral and adorn the tale.

For some few years there has been a more or less strenuous and intensive campaign of education of the public as to the necessity of early diagnosis and early treatment if cancer were to be successfully combatted. In season and out of season the public has been urged to seek medical advice whenever (to stick to our subject) a lump in the breast was discovered. This campaign has been initiated and earried on by the medical profession. That it has been at least partially successful is evidenced by the increasing number of women who have been applying for relief with benign masses of the breast or with carcinoma in the first or earliest stage.

But from my own experience during this period, and I suppose mine is no different from the experience of others, I am forced to the opinion that the members of our profession are not living up to their responsibilities in thus instituting an educative campaign.

The differential diagnosis in the earliest stage of carcinoma demands a refinement in the methods of examination, in judgment and in procedure which if not accepted and acted upon by the profession will bring us into disrepute, and wholly negative the educative efforts above referred to.

I think that we may promulgate the axiom that the more the public is educated to seek advice for early lesions, the more the profession must be educated to recognize and differentiate these early lesions.

The signs and symptoms are not such as "he who runs may read." But careful study of the

current literature and meticulous examination of the patient will reward the man who conscientiously decides to accept this added responsibility.

There is apparently a class of surgeons who in their desire to "play safe" in the problem of cancer of breast, mutilate and remove every breast which shows a chronic lesion.

On the other hand we have the "wait and see" class who do not come to a decision until a classical text book picture of cancer is developed, or until the lapse of time proves the benign nature of the lesion beyond all peradventure. With the last type of case what mental suffering is endured by the patient under "suspended sentence."

Far be it from me to pose as an oracle in this subject. I am here to acknowledge mistakes in diagnosis and errors in judgment. But I believe we will derive most benefit to ourselves and confer most benefit upon the community if we are honest in friendly and helpful criticism rather than submissive and mutual in admiration.

I would like to comment upon and illustrate four conditions, experience with which in the past few years has prompted these remarks.

1. Asymmetry of the breasts in the adolescent. Simple hypertrophy of the breast is well recognized. It may be unilateral or bilateral.

The following case illustrates however an asymmetrical development of the normal breast at or about puberty.

Female child, aet 13, seen in October, 1922. At the age of 11½, while the child was in bed with otitis media the mother noticed a slight swelling of the right breast to which she drew the attention of the physician, who in turn advised the ignoring of the condition.

One year later the right breast had increased considerably in size whereas the left breast had undergone no change.

At the time of examination—at age 13—the right breast was prominent, and in the erect

^{*}Read as a contribution to the Symposium on "'Chronic Lesions of the Breast'' at the Canadian Medical Association Meeting, Ottawa, 1924.

position somewhat pendulous. The left breast showed only the slight subareolar fullness of childhood. Careful palpation failed to reveal any abnormality in texture, shape or weight.

Asymmetry of the two breasts was the only irregularity discernible, and a diagnosis was made of precocious development of the enlarged breast.

The child had menstruated once, two months previous.

Regular menstruation began shortly after the visit and in six months the left breast had almost caught up to the right.

At a recent examination, May, 1924, the girl being then 14½ years of age, both breasts were normally developed but the right still maintained a slight advantage in size over the left.

At this last examination the mother revealed to me that sarcoma of the breast had been diagnosed and amputation advised.

2. Bleeding from the nipple.—Very properly we are suspicious of this sign as we well know it accompanies duct cancer. But we also know that bleeding is associated with other conditions i.e., benign papilloma of the ducts—leaving out of consideration such patent lesions as abrasions and ulcerations of the nipple and superficial granulomata arising therefrom. Also that with apparently no local lesion bleeding from the nipple occurs intermittently at the time of the menopause, to permanently disappear after the completion of that period of life.

We also know that duct cancer is slow in development and slow to metastasize.

If on careful examination and finger palpation one finds a nodule or area of induration, or that the manipulation excites immediate bleeding, all authorities are agreed that the breast should be removed. But in the absence of these signs I do not believe we are assuming our full responsibility if we resort to operation in every case.

I will cite three cases :-

(a) Woman—aet 26—unmarried—full breast-ed—athletic. Seen October, 1922 with history of intermittent discharge from left nipple for previous three months, bloody for past three weeks. Examination: negative, no nodule, no bleeding upon manipulation and "stripping." Advised to wear supporting brassiere.

Seen again September 1923. Discharge had ceased and examination was again negative.

(b) Woman aet 41. Since the age of 36 has noticed at intervals of a few weeks a serous discharge from the right nipple. Married at 38, one child at age 39. Nursed child for ten days only. Nursing from right breast was very difficult as there "seemed to be some obstruction to the flow of milk." At age 41 the serous discharge became bloodstained. Examination revealed full pendulous breasts. Right nipple was excoriated, apparently from irritation of the secretion drying upon and stiffening the undervest. An emollient application easily relieved the excoriation. Manipulation failed to disclose a nodule nor did it excite bleeding.

A supporting brassiere was worn day and night with prompt disappearance of the almost daily bleeding. Serous discharge persists at intervals of a few weeks, and once a year—usually in the springtime (possibly from the exertions of house-cleaning) there is slight bloody discharge.

Examination at age 45 is still negative.

(c) Woman aet 40—3 children—all nursed. Youngest 8½ years old. When nursing this child had "cold" in both breasts. No suppuration. Bleeding from left nipple for six months. Irregular in appearance, preceded by slight discomfort, then extrusion of a drop or two of blood. Examination negative. Concomitant with onset of bleeding there had arisen an irregularity in menstruation which appeared every three weeks, with scant flow for ten days followed by four days free flow.

Referred to Dr. John Fraser for correction of menstrual irregularity. He reported the pelvic organs negative on examination but instituted treatment for an anaemia. In two months menstrual function was again normal and the nipple had ceased to bleed.

Breast examination again negative.

The first two cases undoubtedly have a lesion, a benign papilloma. All three are intelligent and thoroughly understand the significance of recurrence of continued bleeding. They are content to return for examination as long as signs continue.

When such intelligent co-operation is not obtainable then the surgeon is justified in removing the breast.

But I maintain that with the knowledge that

either a benign or a malignant papilloma may produce the bleeding we are shirking responsibility when we remove for a harmless lesion a useful organ; and a breast is useful to a woman not only from the functional but from the aesthetic point of view.

(3) My third observation is in regard to a lesion which possibly does not properly fall within the purview of chronic lesions i.e., acute inflammatory carcinoma—medullary carcinoma—carcinoma simplex—carcinoma of pregnancy and of lactation.

These fortunately are seen but rarely by any one man. Once seen and followed to a conclusion the condition will be indelibly stamped on that man's experience. I have been fortunate or unfortunate to have seen two such cases.

As one synonym implies, the lesion frequently appears during activity of the breast, and, taking advantage of the physiological increase in vascularity it develops with astounding rapidity.

Usually beginning centrally it involves the whole breast with rapid enlargement, pain, and elevation of temperature both local and general. The overlying skin is tense and oedematous, and the whole mass is tender. The glands are early involved and are soft and tender.

Because of the vascularity and the imperfect development of the vessel walls early blood metastasis is also usual.

Unfortunately, early diagnosis and radical operation seldom result in cure, metastasis having already taken place.

But the recognition of the condition will prevent the chagrin of the attendant who incises in order to drain a supposed subacute suppurative mastitis.

(4) My fourth point has to deal with "exploration" of a chronic lesion of the breast.

The very term implies a suspicion of malignancy. No one would *explore* a benign lesion. It would be either left alone or removed.

What then should be the attitude toward exploration. May I formulate my own rules?

- (a) In the flat breasted, especially after the menopause, remove the whole breast, and have it subjected to immediate gross and microscopic section. If the pathologist cannot say definitely that it is benign—proceed at once to complete the classical radical amputation.
- (b) In the full breasted—especially in the younger women, employ the following technique:—

With the knife an elliptical skin incision giving wide berth to the skin overlying the mass under suspicion.

Undercut the skin to thoroughly expose the area of breast surrounding the mass.

With the cautery knife at a dull red to avoid the slightest drop of blood, remove the mass with surrounding breast tissue.

Subject to examination as before and be guided by the similar report.

If undoubtedly benign the sharp knife must then remove the wedge of breast tissue which has been damaged by the cautery. Closure is effected by buried catgut and skin sutures.

To explore with the knife is to court the disaster of blood metastasis even although a radical amputation be completed within an hour of the first incision.

Who can predict with what speed a carcinoma cell, or whatever it is which metastasizes, will travel along a vein and reach a distant part there to lodge and later, safely entrenched, to jeer at the helplessness of surgeon and patient alike.

The Treatment of Inguinal Hernias in Young Infants.—The truss described by L. Charles Rosenberg, Newark, N. J., consists of a triangular pad stuffed with absorbent cotton. To each corner of the pad there is attached a muslin tube about 1 cm. in diameter and 15 cm. in length also stuffed with cotton. The material used is preferably soft muslin. To apply the truss, the pad is placed over the hernia and

one string pasted over each iliac crest to be tied behind in the lumbar region. The third string is brought downward between the thighs and thence backward, and is tied posteriorly. When double hernias exist, a double pad may be made, one to fit over each external ring. This truss is not recommended for older infants.—Jour. Am. Med. Ass., Aug. 30, 1924.

SOME ASPECTS OF THE PATHOLOGY OF CHRONIC BREAST LESIONS*

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THE value of this phase of the symposium on chronic breast lesions depends upon an appreciation of the gross and histological changes which accompany the various clinical types; in addition the proper and sane interpretation of these gross and clinical findings, in order that we may undertake rational therapy.

It is true that in all chronic lesions, the fear of malignancy is the greatest determining factor in the therapeutic procedure. In considering the various types of chronic breast lesions from which patients suffer, we immediately think in terms of uni-lateral or bilateral lesions. The unilateral lesions are characterized by-first, single tumours; second, multiple tumours; third, the thickening of a segment of breast. (This thickened segment may contain a centrally located nodule, or throughout the thickened area there may be multiple small nodules); fourth, the painful breast which is diffusely nodular, the nodules being equal in size and as a rule not larger than buck-shot, the patient complaining of pain; fifth, discharge from the nipple and a mass or masses in the region of the nipple.

In bilateral lesions, we have patients complaining of bilateral pain, who on physical examination present diffuse thickening, with nodules throughout the entire area of both breasts, the nodules being of uniform size. In this group also are painful and thickened breasts seen at puberty.—Figure No. 1.

Unfortunately for us, as well as for the patient, all of these types present potentialities of malignancy. We are constantly asked by patients, and must constantly ask ourselves, whether a lesion of the breast which clinically presents benign characteristics may be the seat of future malignant change; whether the caked breasts, cracked nipples or acute mastitis of

pregnancy predispose to malignant change; whether trauma is an important factor in its causation. Our only method of determining this is by the close co-relation of the gross and clinical findings, the histological changes, and the clinical course of patients who have suffered from benign lesions. Personally I feel that trauma, caked breasts, cracked nipples and acute mastitis probably play no part in predisposing to malignant changes in the breast. However, we are now confronted with an entirely different problem in chronic lesions of the breast, both from a clinical and a histological standpoint than was the case ten years ago. This is largely due to the propaganda which has been carried on throughout the country. As a result, patients are now consulting us complaining of disabilities of the breast which present a much earlier picture of malignancy, and in the majority of which no malignant changes are present. However, realizing that our only hope of cure in malignant diseases of the breast depends upon the early diagnosis and wide surgical removal, our responsibility has tremendously increased, because we are seeing an early carcinoma of the breast which presents both histological and clinical factors with which we have to familiarize ourselves.

You have heard the clinical findings mentioned upon which our bed-side diagnosis rests. It is my aim to visualize for you the changes which are taking place in the breast both in the gross and histological structure. At this juncture let me state definitely, so that my later remarks may not be misleading, that I feel no clinician is justified in assuming an attitude of masterly inactivity when a patient comes for advice with a single definite lump in the breast. Our only advice should be, provided we feel that the tumour is not clinically frankly malignant, to have it, with a section of the breast removed, and a diagnosis made immediately by a combination of the gross and his-

^{*}Read as a contribution to the Symposium on "Chronic Lesions of the Breast" at the Canadian Medical Association Meeting, Ottawa, 1924.

tological findings. While I have only commendation for the value of a frozen section, one must remember that the reliance to be placed on such a section lies solely in the ability of the surgeon to excise the proper area, and on the ability of the pathologist to recognize in the gross the area most likely to contain the carcinoma. This is so important that it is in only a very small percentage of cases where the tissue is removed that one is unable to state positively from the gross appearance alone, whether the lesion is benign or malignant.

It is wise at this point to discuss lesions responsible for single tumours. In a frank carcinoma, the excised mass of tissue will contain one area harder and firmer than elsewhere. On section with a sharp knife we find the tissue surrounding the hard area to be the seat of an inflammatory change, rendering it firmer and denser than normal. In the centre of this area, undifferentiated from the surrounding breast tissue by any capsule, there is a grayish homogeneous area with a concave surface and the surrounding tissue seeming to be drawn towards it. In the centre of this homogeneous area are small yellowish specks standing out in contrast to the otherwise gray field, these yellow areas often being present in streaks. In addition to this there is the definite raw potato appearance. This gross picture is exemplified by Figure 2, representing the scirrhus type of carcinoma. The histological appearance is shown in Figure 3.

The medullary type differs from scirrhus type mainly in the fact that the puckering and drawing to a central point of the surrounding breast tissue is not so marked and there is not the dead grayness which is so characteristic of the scirrhus. The gross appearance is shown in Figure 4.

In fibro-adenoma, clinically characterized by the freely movable tumour, we have also a very characteristic gross appearance. There is no inflammatory change in the surrounding breast tissue, which appears normal. The tumour is contained in a very definite capsule. The cut surface is convex and the tumour seems to bulge out of its capsule as if it were too big to be held within its confines, this cut surface showing whorls of connective tissue, indicating that it is a compound tumour mass. The cut

surface is pearly white. There are no yellow areas, and obviously no contraction of the surrounding breast towards the tumour mass. The histological appearance of this tumour is seen in Figure 5.

A lipoma in the breast may easily cause uneasiness clinically, in that it may be confused with a sarcoma or the rapidly growing medullary carcinoma. The gross appearance of the encapsulated fatty tumour is too obvious for comment. Sarcoma has definite clinical findings prior to removal for gross examination. It assumes large proportions, too soft and semifluctuant for either a cyst or a fibro-adenoma, and its size may be very great and yet with no attachment to the skin or pectoral fascia. On section we have a much more cellular looking tumour mass than in the above. This is a soft growth, reddish in appearance, with a delicate connective tissue stroma, containing numerous thin-walled blood vessels, often with a pseudocapsule from which the tumour mass can be shelled out.

Our next single tumour brings us into the debatable ground of mastitis. Clinically we have a single tumour the result of a solitary cyst in the breast. These cysts are of two types, one containing clear fluid which does not harden in formalin, called by Bloodgood a "Blue Dome Cyst," the gross appearance of which we see in Figure 6. The histological appearance is shown in Figure 7.

The second type of solitary cyst contains creamy contents, hardens in formalin, and is the galactocele type of solitary cyst, the gross appearance of which we see in Figure 8 and the histological appearance of which we see in Figure 9. It will be noted that in the galactocele type there is no epithelial lining to the wall of the cyst, while in the blue dome type there is a definite layer of epithelial cells. These two solitary tumours are probably more often clinically mistaken for carcinoma than any other benign lesion. If one suspects that they are non-malignant prior to the operation and explores the breast by excising the tumour mass and the segment of breast, the blue dome cyst is characterized by showing a definite bluish, smooth area in an otherwise uninvolved breast. This appearance I feel is sufficient to justify the diagnosis of a non-malignant condition. As was stated before in these cases, while

there may be one large, solitary cyst, on exploration may reveal numerous smaller cysts which when seen add additional confirmation of their non-malignant character.

A further single tumour is one in which there is clinically associated a certain amount of pain, which is not characteristic of a cyst. This also



Fig. I.—Adolescent breast, showing simple hyperplasia of the glandular element (Bleodgood).

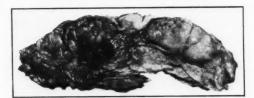


Fig. II.—Scirrhus carcinoma. Note the puckering of the surrounding breast tissue towards the tumour mass. (Binnie)

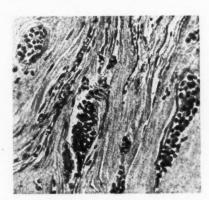


FIG. III.-Histological appearance of scirrhus carcinoma, showing irregularly arranged tumour cells in excessive stroma.

may give clinically a feeling of an involvement of the surrounding breast. On exploration we find a thickening characteristic of a mastitis and with the tumour mass and surrounding breast removed, on section we find a small abscess. This abscess has never given any clini-

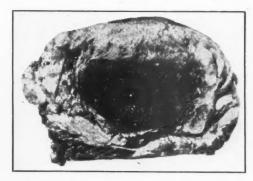


Fig. IV.—Gross appearance of medullary carcinoma. Note the absence of any indrawing of the surrounding tissue, such as we see in Figure II. (Binnie)

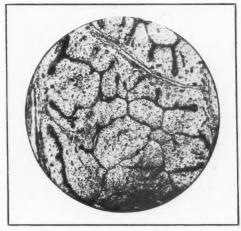


Fig. V.—Histological picture of intracanalicular fibroadenoma. Note the capsule shown at the margin and the compound nature of the tumour. (M & W)



Fig. VI.—Gross appearance of section of breast containing blue dome cyst, showing one large single cyst with smaller cysts in the surrounding breast tissue. (Bloodgood).

cal characteristics usually associated with abscess formation, nor has it given very marked pain—rather a discomfort. On section we find the typical reaction of pyogenic infection, namely infiltration with polymorphnuclear leucocytes and small round lymphocytes, as seen in Figure 10. Our justification for exploring such definitely localized increased hardness or small tumour masses in the centre of a mastitis is due to the fact that on more than one occasion we found a very early carcinoma, when clinically the findings would justify the diagnosis of a small cyst or an abscess. Such a finding makes one insistent that all irregularities in a diffuse segment must be explored surgically.

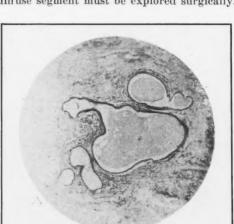


Fig. VII.—Histological appearance of blue dome cyst. Note the epithelial lining of the cyst wall. (Bloodgood).



Fig. VIII.—Section of breast showing gross appearance of galactocele type of cyst.—(Bloodgood)

Often in exploring a tumour mass such as the above in a segment of thickened breast, we cut through abnormal breast tissue, from which exudes creamy material from dilated ducts. Such a gross finding is often considered sufficient evidence to warrant at least a local amputation of the breast. The histological appearance of such a clinical condition is shown in Figure 11. I feel that in view of the lack of cellular changes, which could not even be imagined to approach malignant characteristics, that we are not called upon, nor are we justified, in letting such a condition influence our



FIG. IX.—Histological appearance of wall of galactocele cyst, showing the absence of any epithelial lining in the cyst wall. (Bloodgood).

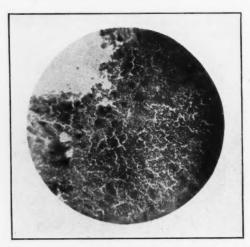


Fig. X.—Abscess cavity in the centre of an area of mastitis, showing typical inflammatory reaction around it. (8 21-1938).

therapy, once we have proven that the tumour mass in the centre of this thickened quadrant is benign. In other words, I agree with Bloodgood1 in the statement that the condition of the breast surrounding the tumour should not influence our therapy. With this conception of the disease process, we are able to avoid many mutilating operations. In a careful follow-up over a period of years, we have been unable to find a single instance where carcinoma subsequently developed following this procedure. Such an attitude will encourage patients to consult the physician immediately on discovering any abnormality in the breast, because they will realize that every abnormality does not demand a mutilating surgical procedure.

One also finds another type of multiple tumour in an area of segmental thickening,

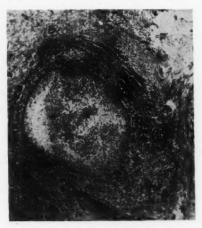


Fig. XI.—Histological appearance of duct and contents from a segmental mastitis. This on gross section exudes a creamy content from many dilated ducts. There is no evidence of irregular epithelial proliferation, hence no suspicion of malignancy. (8/24-1278)



Fig. XII.—Section of breast showing gross appearance of a varicocele tumour. Note the dilated ducts standing out on the cut surface of the breast. The histological appearance is similar to Figure II. (Bloodgood)

characterized by elongated masses. These on section are shown to be dilated ducts containing creamy material, and because of the clinical feeling approaching that of a varicocele, this lesion has been called by Bloodgood the "varicocele tumour of the breast." The gross appearance of such a tumour is seen in Figure 12. The histological changes in Figure 11.

This brings us to the multiple tumours situated in one breast. Such multiple tumours are most often the result of numerous cysts situated in an area of mastitis. The fact that they are multiple is probably one of the greatest factors in making us feel that malignancy is unlikely. It is very unusual to find these multiple tumours lying in an area of otherwise normal breast. It usually falls into our original third group characterized by a thickened segment of the breast with multiple tumours.



Fig. XIII.—Gross appearance of breast the seat of a wide-spread diffuse cystic mastitis. (Bloodgood)

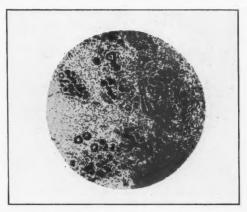


Fig. XIV.—Atrophic mastitis, showing proliferation of the stroma, and atrophy of glandular elements.

In this we enter definitely into a discussion of the disease known as chronic cystic mastitis. The clinical type is usually a young woman, usually married and having borne children who complains of painful breast, which on examination reveals a quadrant thicker than normal, but no definite tumour mass which can be distinguished in the thickened area. There are three definite histological changes which are found, and when present give us great peace of mind as far as the possible presence of carcinoma is concerned. (The gross and histological changes are shown in Figures 13, 14, 15 and 16. In Figure 14 we have our change taking place, in the stroma of the breast, with atrophy of the gland acini. In the second type, seen in Figure 15, there seems to be

an equal activity in the stroma and gland, both tending to increase. In the third, seen in Figure 16, we have our change taking place more particularly in the gland acini, producing adenomatous-like areas, but unlike the fibro-adenoma, having no definite capsule. In all these histological changes, while we have cellular activity, it is following along normal lines, and gives no suggestion in its histological characteristics even approaching malignancy.

There is a fourth type, however, in which we find the change limited largely to the acini, but the characteristic arrangement of the cells is departing from normal, as shown in Figure 17. Here we see large, pale cells, completely filling the lumen and piling up layer upon

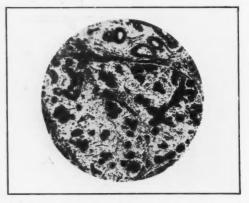


Fig. XV.—Chronic mastitis showing proliferative changes in both glands and stroma.

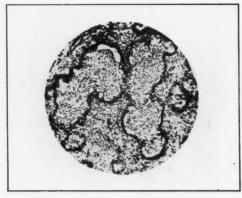


Fig. XVII.—Marked proliferation of the large pale cells lining the ducts; completely filling the lumen. This is often regarded as a pre-cancerous condition.

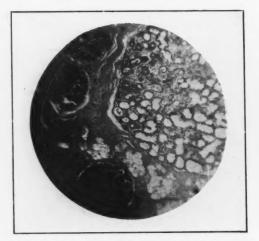


Fig. XVI.—Chronic mastitis showing diffuse adenomatous-like areas, which, however, are not contained within a capsule. (8 21-3287)



Fig. XVIII.—Shotty breast showing very marked diminution in the epithelial structures, marked increase in the stroma, but no evidence of any malignant change. (8 21-143)

layer, but still confined within the wall of the duet, and in no place are they breaking through the limiting basement membrane, This I feel is the type which we may justifiably term "precancerous," and demanding a local amputation of the breast for its proper treatment.

Our next group of chronic lesions consists of the painful breast, that is either uni-lateral or bilateral, in which there is a granular feeling equally distributed throughout the breast, with no alteration in the size of the small tumour masses. This is the type of non-malignant, painful breast which one sees so often during the menopause. Because of the fact that these tumour masses usually are about



Fig. XIX.—Duct papilloma. Drawing of gross specimen showing a dilated duct containing a benign papillomatous growth.



Fig. XX.—Histological appearance of a benign duct papilloma. Notice the marked epithelial activity, with papillary projections into the lumen of the duct. (Mallory)

the size of buckshot, and are so diffusely widespread throughout the breast tissue, this type has been termed by Bloodgood the "shotty breast," the histological characteristics of which are seen in Figure 18. These changes are so devoid of malignant characteristics that there is no cause for alarm, and I feel they demand no surgical treatment, because what else, apart from a bilateral or uni-lateral amputation as the case may be, would be of the slightest avail, and surely with such histological findings we are justified in advising against surgical interference.



Fig. XXI.—Duct carcinoma, showing the normal epithelium of the ducts, replaced by tumour cells. (Comedo-adeno-carcinoma, Bloodgood). (8 22-775). Patient still well 2½ years after radical operation.

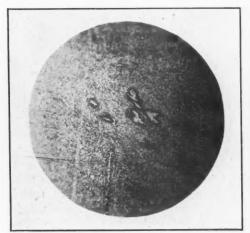


Fig. XXII.—Sarcoma developed from the stroma of a pre-existing fibro adenoma. (823-1236). Patient still well at 15 months after radical operation.

The last group has to do with bleeding nipples. While I feel that it is imperative that all such cases must be carefully investigated, it does not necessarily follow that all are maligpant thereby requiring surgical treatment. However, in a series of reported cases, eighty per cent of breast lesions with bleeding nipples were malignant. I feel that Bloodgood's conservative treatment of patients with bleeding nipples may lead to disaster. His statement that only two per cent of the carcinomas of the breast had bleeding nipples, may be true, but fails to emphasize the fact that eighty per cent. of the bleeding nipples are carcinomas; therefore we must conclude that this serous or serosaneous discharge from the nipple means abnormal cellular activity of the epithelium of the ducts in close proximity. However, often we find clinically a tumour mass situated in the region of the areola and the patient may volunteer the statement that the tumour is there on one day and impossible to find on another. This is the classical disappearing breast tumour, and is explained by the fact that the tumour itself is due to a transudate in a dilated duct, coming from either a duct papilloma or a duct carcinoma, and being intermittently discharged through the nipple. The gross appearance of this is shown in Figure 19 and the histological appearance is seen in Figure 20. While there is tremendous epithelial activity, the cells are typical and show no evidence of malignancy in contradistinction to Figure 21. This illustration is from an unusual type of duct carcinoma in which there was a diffuse thickening of the breast, no palpable tumour, but a discharge from the nipple. On gross section we found a thickened breast from which exuded at many points creamy fluid, evidently arising from diffusely dilated ducts. On histological examination we found these ducts filled with carcinomatous cells. Because of the gross appearance, Bloodgood has aptly called this "comedo adeno-carcinoma." With such clinical findings, associated with bleeding nipples, I feel that a local amputation, rather than a resection of a portion of the breast, must be our preliminary procedure. Before dismissing the question of discharge from the nipple, one must consider the pathological processes associated with Paget's disease of the nipple. I feel that Paget's disease of the nipple is a dis-

ease primarily situated in the nipple itself; that there are gross and pathological changes of an inflammatory nature which may be present in the nipple for some time. These can often be readily cleared up by cleansing the nipple daily and applying some emollient dressing or alcohol, great care being taken to protect the nipple from further trauma. There are several such cases in our series. However, when an ulcer develops, one must be very markedly on guard, and unless there is a response within a very short time, one should consider the case malignant and proceed with a radical amputation. In a case within the last month with such a history, there were extensive metastases in the axillary glands, as well as throughout the ducts in the breast. Thus we must regard Paget's disease of the nipple which does not readily respond to conservative treatment as a carcinoma effecting the superficial epithelial tissue of the nipple, in the same way as we consider squamous carcinoma elsewhere in the body.

There are many who criticize a local resection of a segment of breast because of the fact that we traumatise the tissue and thus render it more liable to subsequent malignant change, or that we leave abnormal surrounding breast tissue which may become malignant. Such an objection I feel is unsound, first because with resection our reparative process is entirely mesoblastic, that is the epithelial tissue plays no part in this repair. Further we must establish a much more definite relationship between trauma and new growth than there appears at present before it offers a real objection; thirdly we have been unable to find any case in which we did such a diagnostic resection where a new growth subsequently developed; hence if such does occur, one would feel that either the wrong section of breast had been removed by the surgeon, or that an incorrect interpretation of the histological changes had been made in the first instance. When asking for conservation of breast tissue in certain of these lesions, it may be considered that one is inconsistent in advising the removal of a fibroadenoma which is capable of such accurate diagnosis clinically. I feel fibroadenomata should be removed, as such tumours may develop malignant changes in the stroma. The histological picture is shown in Figure 22, of a sarcoma developing from the stroma of a preexisting adenoma.

I wish to thank Dr. J. C. Bloodgood of Baltimore and Dr. F. B. Mallory of Boston, for their courtesy in allowing me to use several illustrations, also I wish to express my indebtedness to the Pathological Department of the Toronto General Hospital for their aid in the preparation of the illustrations.

REFERENCE

(1) "Archives of Surgery," Vol. 3, p. 445 to 542.

ANAESTHESIA IN BREAST OPERATIONS

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Toronto

AS shock is the chief worry of the surgical team in major breast operations, such as the radical removal, the question of the choice of anaesthetic is an important one because the degree of shock encountered depends to a considerable extent on the anaesthetic employed. Nitrous oxide-oxygen, I believe to be the anaesthetic of choice because in my opinion there is, clinically, less shock with this agent in these operations than with any other.

There may be several reasons for this. In

the first place, nitrous oxide is the least toxic of all known anaesthetics and produces little or no change in the various functions, such as kidney or liver. Seedlings remain dormant indefinitely in an atmosphere of pure nitrous oxide and plants will grow in nitrous oxide to which has been added comparatively small amounts of oxygen. A dog has been anaesthetized continuously for seventy-two hours and has recovered with no apparent damage. Also, it is possible that shock may be brought about by the absorption of certain histaminelike bodies generated when tissues are injured. Now it is known that histamine itself, in doses too small to produce any effect on the blood pressure in a normal animal, will cause a fall in blood pressure in an animal which is being etherized or chloroformed. When nitrous oxide

is being used, this, it is said, does not occur, that is, this anaesthetic does not seem to increase the susceptibility of the animal to histamine. It may be, therefore, that the corresponding is true of these histamine-like bodies. Again, the loss of body heat from the extensive raw surfaces exposed in the radical resection is undoubtedly a contributory factor in the production of shock. With nitrous oxide there is not a further loss of heat due to the breathing of air made cold by the evaporation of ether on an open mask.

In addition to this relation to shock one must remember that any nausea or vomiting occurring post-operatively is more apt to be transient with nitrous oxide than with the other anaesthetics, and also it is to be borne in mind that, while pulmonary complications are rare, it is possible that the incidence is less than with the more irritating ether and chloroform.

As for breast operations of a minor nature, nitrous oxide should have the preference if for no other reason than that the patient will usually recover from her anaesthetic with less discomfort than with the other agents.

The disadvantages are the increased cost, the necessity of a cumbersome apparatus and the imperativeness of some special training on the part of the administrator.

Atypical Mumps .- The case reported by William L. Gould, Albany, N. Y., is atypical and unusual in that but one parotid gland was attacked, with a complicating metastisis to almost the whole of the same side of the body, the opposite side remaining entirely free.—Jour. Am. Med. Ass., Sept. 13, 1924.

SILICOSIS IN ONTARIO GOLD MINERS*

JABEZ H. ELLIOTT, M.B., F.A.C.P.

Toronto

THE studies of miners' phthisis in the gold miners working in the silicious deposits in South Africa and Australia, the reports of Lanza and Childs on a large number of cases found in the silicious zine miners of Missouri, and the studies of Jarvis, Baldwin, and others in the granite industry of Barre, Vermont, have demonstrated the prevalence of silicosis in men working for long periods of time in quartz, granite, and other silicious rock.

Extensive mining operations have been carried on for several years in Northern Ontario in the silicious gold-bearing ores, and the industry is developing and extending rapidly. The gold-bearing ore shows about twelve per cent of quartz. Most of the mining is done in schist, which is highly silicious, but, as it does not show the same sharp fragmentation as quartz, it has been presumed that its fine dust does not cause as great irritation or damage in the lung when inhaled. However, the report on its dust samples shows the particles have uniformly jagged and sharp edges and are occasionally needle-like in form.

Pathology.—The recent work of Magrogordato, who has been studying experimental silicosis in connection with an investigation of the disease in South African gold miners, would seem to lead to the conclusion that the silicious dusts are non-harmful from the mechanical point of view and that previous theories as to the aetiological significance of sharp edges and the acicular shape of dust particles have now been discarded. It would appear from his work and that of other investigators that small particles of silicious matter are taken up by the tissues in the form of colloidal silica and confer upon the cells, which invest them, the property of protection from autolysis and digestion in the lymph. It is suggested that such particles are slightly soluble in the alkaline tissue juices and that alkaline sili-

cate so formed pervades the cell preserving it as water glass preserves eggs. The cells containing silica particles flock together and form small masses which may be called pseudotubercles, and the similarity of silicosis with early stages of tubercle is remarkable. These pseudo-tubercles later undergo fibrosis and cause lymphatic obstruction.

The suggestion of the Director of the Division of Industrial Hygiene, Provincial Board of Health, that it seemed desirable to know whether mining operations in Ontario were causing miners' phthisis in the underground workers was kindly received by both the Provincial Health Department and the Department of Mines, and the Division of Industrial Hygiene was requested by the Chief Inspector of Mines of the Province of Ontario to undertake such an investigation.

The x-ray plates have been read by Dr. G. E. Richards of the Toronto General Hospital, and through the courtesy of Dr. R. R. Sayers, Chief Surgeon, U. S. Bureau of Mines, by Dr. Henry K. Pancoast, Consulting Physiologist, U. S. Bureau of Mines.

Two separate studies were made:—(1) As to the presence of silicosis; (2) Dust counts at the breathing level of the men engaged in various operations.

1.—The Presence of Silicosis

Silicosis is a disease of slow development. Few cases have been found in those under five years at work. The Barre investigations showed that of 427 cases of silicosis studied there were six first stage cases under five years and 3 second stage cases.

A large proportion of the miners in the Ontario camps had been engaged in mining elsewhere. These were eliminated from the present study. Operations above ground do not expose the men to air heavily dust-laden. Men engaged in such work were not studied.

These considerations led to the adoption of three requirements:—(1) Had worked in the

^{*}Presented at the annual meeting Canadian Medical Association, Ottawa, June 18, 1924.

Porcupine camps over five years; (2) Had not mined in any other camp than Porcupine; (3) Had worked underground all or the greater part of that time.

Of some 1800 men employed by one mining company, the mine surgeon was able to find only eleven men who met these requirements. Careful history taking, clinical examinations and study of stereoscopic roentgenograms (repeated in some cases) led to the following conclusions:

Of the four with well-marked silicosis, three are machine drillers and the fourth has been timberman and shift boss underground for eight years. Of the two with early silicosis, one has been machine driller five years and mucker four years; the other, mucker four years and machine helper one year. Of the three with peribronchial fibrosis, possibly a dust fibrosis, one has been scaler one year, timberman three and a half years, with mining experience elsewhere. One has driven electric

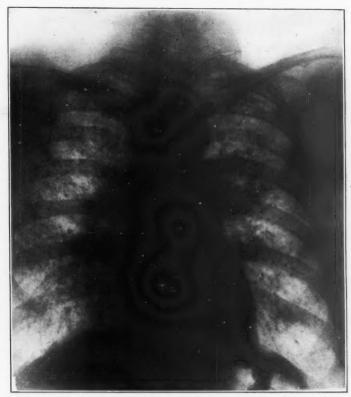


PLATE I.—CASE No. 182
Extensive bilateral silicosis. Early second pneumoconiosis. (Dr Pancoast).

Four showed some definite evidence of pulmonary silicosis, and in three of these the stereograms showed mottling in the apices which might possibly be considered as tuberculous deposits.

Three showed moderate peribronchial fibrosis, which may or may not have been due to dust.

Two showed an early stage of silicosis (peribronchial fibrosis without lung involvement).

Two were considered free from silicosis.

motors for seven years underground; one has been mucker, driller, helper and cageman. Of the two with no silicosis, one, underground six years, has been mucker four months, driller four years, machine helper ten months; one has been timberman ten years.

CASE HISTORIES

No. 182.—Italian, age thirty-one—no history of contact with tuberculosis. Occupational history—farming five years in Italy, at fifteen came to Canada; railroad construction three years, back to Italy for two years, returned to Canada 1912, ten years in Porcupine camp,

surface four months, hammer drills two years, water drill six years, shooting blast two years, foreman of muckers. No evidence of contact with tuberculosis. Previous illness: none before mining; since mining, "strained" right chest wall, necessitating lost time from work of four or five days; la grippe fifteen days; occasional shooting pains in the chest; frequent colds in the winter

time during the last four or five years.

Present condition. - Symptoms: - Hard, resistant cough on going to bed and in the morning until about nine o'clock; little in the day time; considerable expectoration both at night and in the morning, generally clear but sometimes black, always worse when he has a cold; has dyspnoea on slight exertion, walks up stairs slowly, says he cannot work as well as he did, has felt weakened for past two years, never fainted; put on weight following 1914 but since 1919 has lost four or five pounds; has pain in chest when he gets a cold, at times without a cold has pain "like pins" in anterior chest, sometimes hurts to breathe, the chest feels tight when he has a cold; some days feels very well, but if it rains has pain across the back and right shoulder for three or four days, with changing weather has pains in the calves of legs and ankles; no night sweats.

Physical examination.—No cough, no pain; dysp-noca marked on exertion; says "can't run very far for last two years." Well nourished; subcutaneous fat plus: last two years.'' Well nourished; subcutaneous fat plus; large, full chest; subcostal angle 90°; no depressions; antero-posterior diameter increased; expansion 361/2-38 inches; chest fixed type; superficial cardiac dullness small area near sternum, left side, fourth rib, fifth interspace; apex normal; lung borders below move freely; apices full width; lung fully resonant throughout; vocal fremitus, no change; vocal resonance, no change; respiratory murmur normal throughout; few marginal crackles right axilla. Blood pressure, systolic 122, diastolic 94; pulse rate, 76; heart sounds, normal; tonsils, enlarged but smooth. Sputum examination.— Tuberculosis, negative; dust, positive. Radiology (Dr. G. E. Richards).-The heart and arch of the aorta are normal in size, shape and position. The diaphragms are smooth and even, and movement is not restricted. The hilus shadows are rather heavier than is considered normal, and many calcareous glands and nodes are present in each. Radiating out from the right side, the bronchial tree is distinctly heavier than normal, and the whole lung tissue on this side is studded with a number of minute calcareous nodules, which are fairly evenly scattered throughout the entire periphery on the right side. On the left side a similar appearance is present, and the result is to give the lung the appearance of being studded with fine discrete densities resembling sago grains. There are no localized lesions, and no evidence of infiltration in the parenchyma at any point.

Summary .- In my opinion, the examination points to the presence of a moderate degree of peribronchial fibrosis, with a miliary deposit of calcareous material throughout the chest. It does not suggest a tuberculous process, but rather a non-tuberculous density, such as

is present in silicosis.

Radiology (Dr. Pancoast)-Plate No. 1. second stage pneumoconiosis; hilum shadows increased; trunk shadows thickened generally; diffuse mottling throughout most of the right lung and in left lower lobe. Diagnosis.—Extensive bilateral silicosis.

No. 216 .- French Canadian, age thirty-five. ... Occupational history.-(1) Previous to mining-bush work beginning at thirteen years of age; at fifteen years, axe work, driving logs until twenty years; prospecting for three years; mining and prospecting mixed for three years until went to Porcupine. (2) Mining history-(a) Elsewhere-very little during three year period previous; all in northern Ontario. (b) Porcupine camp-here ten years; two years prospecting; half this time in mine; timbering four years; six years shift boss underground. Family history.- No tuberculosis. Personal history.

-Slept in next bed to a case of tuberculosis while in camp six years ago. Previous illness: no sickness before began mining; since mining has had typhoid in 1910 and rheumatism in 1920, when he was in bed for two months; suffered from some shortness of breath after that; has colds four or five times in the winter, none in summer time.

Present condition .- Symptoms: Coughs only when he has cold in the winter time, with thick, brownish-yellow expectoration; no dyspnoea now; lost twelve pounds when he had rheumatism in 1920 which he has never regained; no pain or tightness in the chest; when he had a bad cold two months ago had night sweats sufficient to completely saturate night clothes, no night

sweats now; continual constipation.

Physical examination.—Antero-posterior diameter of the chest increased, with sternum rather prominent; subcostal angle is narrow; chest is rigid; scarcely appears to move on deep inspiration, yet the measurements are 321/2 to 341/2. Moderate general hyperresonance with precordial dullness lost; clavicles prominent-deep fossae above and below; lower lung borders low and move freely; breath sounds generally diminished—no adventitious sounds; clinically:-emphysema, moderate grade with suggestion of fibrosis. Sputum examination .-Tuberculosis, negative; dust, positive; pus cells, plus,

Radiology (Dr. G. E. Richards)-The heart and arch of the aorta are normal in size, shape, and position. The diaphragms are smooth and even, and movement is not restricted. The hilus shadows are moderately heavy on both sides, and calcereous glands are present in both. In the left several of these appear to have been caseous. Extending out from the right hilus there is well-marked coarse mottling distributed over the entire lung tissue from base to apex. These areas of mottling show further localized areas of increased density, with fibrosis, particularly present in the apex, first and second interspace trunks and extending along towards the hilus shadows in both of these regions. On the left side a similar appearance is present, also distributed over the entire lung tissue from base to apex, with localized areas in the apex, and first and second interspace trunk towards the periphery. The mottling is very coarse, and very widely distributed throughout the entire lung tissue on both sides of the chest. Evidences of slight compensatory emphysema are present at both bases. I believe these are evidences of extensive tuberculosis involvement, but also it is exceedingly probable that many of the areas of mottling which are seen in these plates are due to deposit in the lung, which should be interpreted as anthracosis. These are in the nature of multitudes of small, discrete densities, which are too large to be miliary tubercles, and are too discrete to be tuberculous

A second set of plates made four months later were read as follows:-The diaphragms are smooth and even, and movement is not restricted. The hilus shadows are both increased in density, the left being much heavier than the right. Calcareous glands are present in both, but particularly in the lett. Radiating out from the right hilus, the bronchial tree expands immediately into a lung which is filled with areas of mottling extending from the extreme apex to the extreme base. are heavier in the region of the apex and first and second interspaces than elsewhere, and in this region of the lung there is a suggestion of grouping in clusters, or small conglomerate shadows suggesting localized areas of infiltration. Towards the base the appearance is that of a multitude of fine discrete nodules. On the left side an almost exactly similar appearance is present, the density being slightly less heavy and less numerous. In the base the lung appears almost clear.

Summary .- From a radiographic standpoint, the appearance is that of a wide-spread fibrosis with numerous areas of localized density, which are more particularly present in the upper two-thirds of each lung. In these areas many of the patches which are seen present the appearance of conglomerate shadows such as are formed by tuberculous infiltration in the parenchyma, but the distribution is much more extensive, and is bilaterally symmetrical. From the plates alone without any other information, I would not feel justified in a definite differentiation between a tuberculous infection and anthracosis. Knowing the history in this case, I believe the changes are due to silicosis and not to a tuberculosis process.

Personal history.—Was in lumber and railway camps for six years but does not know of any special contact with tuberculosis. Previous illness: never sick a day before he began mining; since mining has lost only one day from sickness.

Present condition.—Symptoms: Frequently has slight, dry cough which occasionally wakens him at night; worse when he goes from a low temperature to a higher one; small amount of dark expectoration a few times a day; no dyspnoea at ordinary work; says he

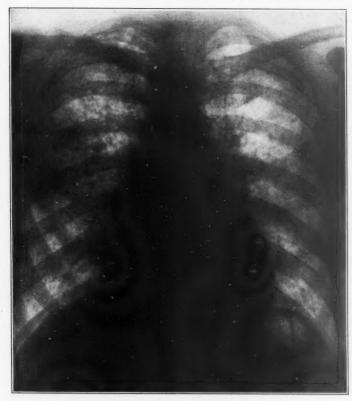


Plate II.—Case No. 216
Wide-spread bilateral silicosis. Second stage pneumoconiosis. (Dr Pancoast).

Radiology (Dr. Pancoast)—Plate II. Second stage pneumoconiosis; dense hilum shadows not increased in extent; trunk shadows rather prominent; right lung; slight mottling in lower lobe; marked diffuse mottling entire upper lobe with considerable density; distribution strongly suggestive of a chronic tuberculous process addition to pneumoconiosis; left lung: mottling throughout and distribution more concentrated around the hilum suggests pneumoconiosis mainly; apex uncertain for tuberculosis.

Diagnosis.—Wide-spread bilateral silicosis.

No. 2164.—Italian, age thirty-two. Occupational history.—(1) Previous to mining: Canada, 1906; railroad construction four years; T. & N. O. two years. (2) Mining history—(a) Elsewhere—none; (b) Porcupine camp—Sept., 1912; surface one year; mucker one year; running hoist six months; machine helper one year; machine driller two years; contract (in mine) one year; machine drills at present, wet.

machine drills at present, wet.

Family history.—No tuberculosis in family; father died after rain and cold, sick three days; caught pneu-

monia (1).

can run a little but not too much; no loss of weight; when he gets cold has pain in the right shoulder and at times in the sternum; for the past two years has frequently had a "stitch" under the costal margin in front, first on one side and then on the other, has not felt this recently but previously was very marked; no night sweats.

Physical examination.—Nourishment, fairly good; subcutaneous fat, slight; colour, high; dyspnoea, none; "I can run all I want." Chest, good general contour with angle of Louis and second costal cartilages prominent; clavicles prominent with depressions above and below; subcostal angle 70°; chest expansion, semi-rigid type, good movement below, expansion 34¼ inches to 25½ inches; percussion, good movement lower lung borders; apices, narrow; poor resonance outer third of clavicles; no precordial dullness (superficial). Pulse, 64; heart sounds, normal; P. M. I. 5th space beneath nipple; B. P. systolic, 108; diastolic, 74. Right, one to three ribs anterior: inspiration, harsh; expiration, prolonged. Vocal fremitis, equal throughout chest. Vocal resonance plus, right one to three ribs anterior. Moderate general hyperresonance. Breath sounds, well heard over

whole chest posteriorly; few indefinite sticky râles just above base of spine, right scapula. No tonsillar enlargement.

Sputum examination .- Tuberculosis, negative; dust,

positive; epithelial cells, positive.

Radiology (Dr. G. E. Richards)—The heart and arch of the aorta are normal in size, shape and position. The left diaphragm is smooth and even, and movement is not restricted. The right diaphragm is slightly angulated in the region of the dome, indicating failure of expansion of the right lower lobe. The hilus shadows are excessively heavy on both sides. Extending out from the right, the bronchial tree over the entire right side is heavily thickened, and marked mottling is present rather coarse for a miliary tuberculosis and I believe the appearance is anthracosis with other areas which suggest tuberculous infection in the position described.

A second pair of plates made four months later were read: The heart and arch of the aorta is normal in size, shape, and position. The diaphragms are smooth and even, and movement is not restricted. The hilus shadows are both heavier than is considered normal, and both contain calcareous glands and nodes. The interlobar pleura between the right middle and lower is distinctly seen in its entirety. Extending up from the right hilus, the vertical bronchus is much thickened, and expands towards the apex into a definite density occupying the apex and first interspace trunk in front, and extend-

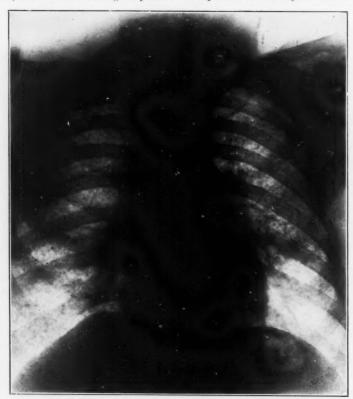


PLATE III.—CASE No. 2164 Silicosis of both lungs. Typical second stage pneumoconiosis. (Dr. Pancoast).

over the whole of this side. On the left side there is a similar degree of mottling which extends from the apex to the extreme base, and is heaviest in the midlung area. This is associated with considerable fibrosis throughout the lung tissue, and on the two sides the appearance is characterized by the presence of large numbers of small discrete densities resembling sago grains. The distribution is even, and presents all the radiographic characteristics of rather well-marked anthracosis with a number of localized areas of increased density, which suggest a localized tuberculous area. These are present in the right upper at the level o the first interspace, in the right mid-lung area, and most markedly of all in the left mid-lung area at the level of the second and third interspace trunks.

The appearance suggests that of a disseminated miliary type of tuberculous infection, and this must be differentiated from anthracosis. The shadows are ing down to the third rib posteriorly. Throughout the romainder of this side the entire lung is scattered with a multitude of fine discrete fibrotic nodules resembling in size and shape sago grains scattered over the whole lung

On the left side there is a slightly heavier shadow in the apex and first interspace trunk, but apart from this, the whole lung on this side is also covered with a similar fine mottling, which extends from the extreme apex to the extreme base.

Summary.-From a radiographic standpoint, the appearance is that of a miliary deposit of either calcareous material or dust particles. The localized shadow in the right upper is that of an area of infiltration in the lung, and this is also true in the left apex to a less extent. In the right apex there is a suggestion of pleural thickening and retraction over the apical cap.

Radiology (Dr. Pancoast)-Plate III. Typical

second stage pneumoconiosis. Hilum shadow on the right side considerably increased in extent; left side hidden by heart and arch of aorta, probably almost similarly increased; diffuse fine mottling throughout both lungs, more noticeable on the right with more spots and extending from the diaphragm to each extreme apex; somewhat fewer spots on the left side but distribution just as wide; left apex entirely clear of any evidence of tuberculosis; right extreme apex slightly suspicious; diaphragm on each side shows a slight humping at the inner and middle thirds usually found in this stage.

Diagnosis.-Silicosis of both lungs.

No. 2005.—Finlander, age forty-two. Occupational history.—(1) Previous to mining—on farm, nine to eighteen years of age; at eighteen years came to

sometimes worse in the morning but continues throughout the day; during the past ten years has been getting worse; considerable amount of thick, black expectoration; has had shortness of breath for four years, even when he works or walks, when he must rest for a short time about every twenty minutes, cannot run; in the past eleven mouths has lost sixteen pounds in weight; no pain or tightness in the chest; occasional night sweats, clothes wet in the morning, with alternate sensations of heat and cold; teeth are gone; cannot eat meat; has no appetite and in the morning feels shaky and dizzy.

Physical examination.—Chest rigid; rather flat; subcostal angle 140°; moderate general hyperresonance; lung borders low and do not move well; breath sounds generally diminished; a few sticky râles interscapular



PLATE IV.—CASE No. 2005

Extensive bilateral fibrosis due to silicosis in the late second or early third stage. Advanced second stage pneumoconiosis. (Dr. Pancoast).

Michigan, iron mines. (2) Mining history.—(a) Elsewhere—travelled extensively; two years iron mine in Michigan; has worked in coal, lead, zinc, gold, silver and copper mines; (b) Porcupine camp—nine years, with exception of two visits to Finland; has always worked on drilling machine.

Family history.—No tuberculosis in family—mother and father both alive and well; brothers, one alive and well, two dead—one of influenza; sisters, two alive and

well, one in Canada.

Personal history.—No special known contact with tuberculosis. Previous illness: no sickness before he began mining. Since mining he had rheumatism twelve years ago, four months in bed, very severe; since then has had slight pains in joints but never stops work; has frequent colds both in winter and in summer.

Present condition .- Symptoms: His cough is loose;

right and left throughout inspiration; dullness over hilus to the left of sternum; heart, P. M. I. 5th space, not out; visible pulsation in the neck over carotids and in antecubital fossae; slightly collapsing quality in pulse; blood pressure: systolic, 126-136; diastolic 68-70; soft diastolic murmur to the left of sternum at 4th and 5th ribs; Wassermann negative. Sputum examination.—Tuberculosis, negative; dust, positive; epithelial cells, positive.

Radiology Jan. 27th, 1922 (Dr. G. E. Richards)—
Two single plates of the chest received, both of which
show very extensive areas of mottling and fibrosis, within
almost the entire extent of both lungs. The only part of
the lung tissue which does not show involvement is the extreme bases on both sides. These areas of mottling
present all the radiographic characteristics of old
fibrosis, with areas of infiltration involving practically

the entire lung tissue on both sides, with the exception of the extreme base. This fibrosis is of the type which is consistent with a history of silicosis and which probably is correctly interpreted as representing this condition, rather than a tuberculous process. The amount of deposit is extensive, and is very well marked, but the plates are not stereoscopic and cannot be reported upon in more detail from that aspect.

A second set of plates of the same man have since been received, October 31st, and these confirm the previous report, showing an exceedingly well-marked fibrosis with mottling distributed over the entire lung tissue on both sides. I believe we are justified in concluding that

this is a true anthracosis.

A set of plates made three months later gave this reading:—Stereoscopic plates were made of the chest. The heart and arch of the aorta are normal in size, shape, and position. The left diaphragm is smooth and even, and movement is not restricted. The right diaphragm shows evidence of adhesions between the visceral layer of the lung and the upper surface of the diaphragm with incomplete expansion in the right base of the lung. The hilus shadow is excessively heavy on both sides. Radiating out from the right hilus, the bronchial tree shows very marked fibrosis and peribronchial thickening with masses of infiltration and mottling over the right apex, particularly in the posterior part of the lung, and a similar degree of fibrosis extends over the whole right side down to the extreme base. On the left side the upper third of the lung is occupied by marked fibrosis with areas of mottling, with localized density throughout this whole region of the lung. The lower half of the lung shows a moderate amount of peribronchial thickening and fibrosis, but is comparatively clear as compared with the remainder of the chest.

Summary.—From a radiographic standpoint there is evidence of very marked fibrosis throughout the entire right side and the upper half of the left side. Numerous areas of localized density are present which I believe to be areas of infiltration. I would find it impossible to differentiate the fibrosis and areas of mottling here seen from those produced by tuberculous disease, and believe that a tuberculous actiology should be considered unless it can be definitely eliminated by clinical methods.

Radiology (Dr. Pancoast)-Plate IV.-Advanced second stage pneumoconiosis; hilum shadows considerably increased in density and extent; linear markings and trunk shadows considerably accentuated especially on the right side; diffuse mottling throughout both lungs; an increased amount of mottling in each apex makes the case somewhat suspicious of a chronic tuberculous process in addition; there is considerable general fibrosis throughout both lungs and probably some emphysema at the bases; both diaphragms show multiple elevations due to the pull of fibrous bands.

Diagnosis.—Extensive bilateral fibrosis due to silicosis in the late second or early third stage. (This man had extensive under-ground mining experience

before arriving in Porcupine camp.)

2.—Studies of Mine Dust

THE collection and estimation of dust, the temperature and humidity readings, were taken by Mr. W. E. Green, chemist in the Provincial Board of Health Laboratories, under the supervision of Mr. H. M. Lancaster, the Director.

The three types of apparatus in use for the collection of dust samples are:

- (1) The Koniscope where air is forced against a glycerine plate which catches the This was mainly used in the South African investigation.
- (2) The sugar tube in use by the United States Bureau of Mines.
 - (3) The Palmer Spray apparatus.

The last apparatus was adopted as standard for dust collection by the American Public

TABLE I COMPARISON OF DUST COUNTS AND WEIGHTS IN THREE PORCUPINE GOLD MINES

No	ODED ATION	MINE	"A"	MINE Z	€,"B"	MINE "C"		
	OPERATION	Count	Weight	Count	Weight	Count	Weight	
1	Upcast air	230,000	0.126	227,000	0.107	226,000	0.118	
2	Main travel ways			227,000	0.129	234,000	0.106	
3	Levner in Stope	1,673,000	0.620	2.881.000	0.432	1.506,000	0.234	
4	Levner in Drift	2,070,000	0.466	2,389,000	0.466	1,499,000	0.430	
5	Wet Stoper in Raise	17,400,000	1.990	12,550,000	1.608	2,550,000	0.543	
6	Dry Stoper in Raise	221,000,000	15.9	86,000,000	13.00	2,000,000		
7	Mucking in Drift	1,096,000	0.276	756,000	0.225	824,000	0.229	
8	Mucking (taking down back)	916,000	0.512			1,703,000	0.229	
9	Plugger in Stope			208,000,000	14.3			
10	Leyner in Raise					1.982,000	0.284	
11	Wet Stoper in Store	1,704,000	0.610					

NOTE:-The count is per cubic foot. The weight is in milligrams per cubic foot.

In some instances there is considerable variance in the results obtained at the different mines. The ratio of number of particles to weight of particles also varies. This is not surprising, however, when the extent of variable factors met with in dust collection is considered. For example, much depends upon (a) the kind of rock being drilled, tors met with in dust considered. For example, intendepends upon (a) the kind of rock being drilled, (b) the number and type of drills being used, (c) the extent of ventilation, (d) the degree of confinement, (e) the distance the sampling machine is from drilling face, (f) whether sample is taken at breathing level or lower, (g) some men work much harder than others. Samples were taken at breathing level whenever possible and other conditions were

kept as uniform as possible. Any great variance in particular instances will be explained below.

No. 3.—Count at "B" higher, due to a plugger operating in same stope.

No. 5.—"A" count higher, due to two stopers operating. There was only one in use at "B" and "C". Result should not be included here, as the raise was not yet formed and the Leyner was regularly used. Test taken for comparison with Leyner results under similar conditions.

No. 6.—No real dry stoping was obtained at "B" or "C". Samples listed as such at "B" were dry collaring.

No. 6, 10 and 11 are not regular operations and were taken for comparisons only.

Health Association. It has many disadvantages, but its consistent use at least allows us to make comparisons between our own findings.

In this investigation all particles in size from one-half to twelve microns were counted.

South African investigations indicate as the allowable maximum the presence of 300 particles of silicious rock in size from one to twelve microns per 1 cc. of air. This is equivalent to 7, 680,000 such particles per cubic foot of air. See Table I.

Study of the dust counts among other things shows:—

- (1) That the dry drill causes a higher air content of dust of a size considered to produce miners' phthisis than a wet drill.
- (2) The air of upcasts shows a low injurious dust count, due to the high humidity of mine air and the ventilation.
- (3) When collaring dry, dust counts are consistently high.
- (4) The dust counts in dead ends of drifts and in raises are moderately high.
- (5) The amount of harmful dust in the air is similar in all the large silicious rock mines.

Chemical and microscopical report on mine dust.—Samples of rock from three mines were submitted to the Provincial Assayer, Bureau of Mines, Mr. W. M. McNeill, who reported as follows:—

B C D Silica 49.12% 50.34% 52.04% Ferrous oxide 5.15 5.02 5.02 Ferric oxide Trace 0.85 1.63 Alumina 7.82 8.98 8.65 Lime 8.58 7.74 7.34 Magnesia 4.39 4.05 4.13 Sulphide of iron 7.16 5.90 4.66 (Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44 Water (combined) 1.45 1.35 1.44				
Ferrous oxide 5.15 5.02 5.02 Ferric oxide Trace 0.85 1.63 Alumina 7.82 8.98 8.65 Lime 8.58 7.74 7.34 Magnesia 4.39 4.05 4.13 Sulphide of iron 7.16 5.90 4.66 (Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44		В	C	D
Ferric oxide Trace 0.85 1.63 Alumina 7.82 8.98 8.65 Lime 8.58 7.74 7.34 Magnesia 4.39 4.05 4.13 Sulphide of iron 7.16 5.90 4.66 (Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44	Silica	.49.12%	.50.34% .	52.04%
Alumina 7.82 8.98 8.65 Lime 8.58 7.74 7.34 Magnesia 4.39 4.05 4.13 Sulphide of iron 7.16 5.90 4.66 (Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44	Ferrous oxide	. 5.15	. 5.02	5.02
Lime 8.58 7.74 7.34 Magnesia 4.39 4.05 4.13 Sulphide of iron 7.16 5.90 4.66 (Pyrite) 80da 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44	Ferric oxide	Trace	. 0.85	1.63
Magnesia 4.39 4.05 4.13 Sulphide of iron 7.16 5.90 4.66 (Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44	Alumina	. 7.82	. 8.98	8.65
Sulphide of iron 7.16 5.90 4.66 (Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44	Lime	. 8.58	. 7.74	7.34
(Pyrite) Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44	Magnesia	. 4.39	. 4.05	4.13
Soda 1.08 1.16 1.24 Potash 1.78 1.92 1.84 Carbon dioxide 13.40 13.04 12.44		. 7.16	. 5.90	4.66
Carbon dioxide13.4013.0412.44		. 1.08	. 1.16	1.24
	Potash	. 1.78	. 1.92	1.84
Water (combined) 1.45 1.35 1.44	Carbon dioxide	.13.40	.13.04	12.44
	Water (combined)	. 1.45	. 1.35	1.44

99.93% 100.35% 100.43% (Signed) W. M. McNeill,

Provincial Assayer.

Mr. P. E. Hopkins, geologist to the Bureau of Mines reported the following analysis of the dust samples collected from the air near machine drills at work.

	Silica																56.06%
	Iron	and	A	lu	m	in	a										15.96%
	Lime									۰	٠						6.6 %
	Magr	esia							۰		۰						1.56%
N	B-Iro	n es	ti	ns	ti	he		91	2	1	Po	327	ri.	e	23	vi	de

Dust samples A, B, C, and D were mounted between glass with Canada balsam and examined under a microscope. Practically all the particles are irregular in outline, having jagged and sharp edges and occasionally being needle-like in form. The smallest particles could not be identified, but they are probably similar to the large pieces. The larger fragments consist of quartz, feldspar, carbonate, silicate, leucoxene, and iron oxide, etc. They are 0.1, 0.2 and 0.3 mm. in diameter. According to Mr. Ellis Thomas, the numerous smaller particles are 0.0008 mm. in diameter.

Conclusions and Comment

The following suggestions were made:-

- 1.—That men who have worked for five years in mines elsewhere be examined with the fluoroscope if engaged for underground work, and that a yearly examination be made thereafter.
- 2.—That all employees be examined with the fluoroscope at end of 5 years' underground work and yearly thereafter.
- 3.—That when the fluoroscope reveals possible dust deposit and fibrosis, that stereographic radiograms be studied.
- 4.—That when fibrosis is found the men be given surface employment.
- That the use of the dry drill be discontinued.
- 6.—That all surfaces be kept constantly wet.
- 7.—That provision be made for thorough ventilation.

Though the occurrence of miners' phthisis is proven, it does not appear to be a serious problem at present. This is doubtless due principally to the fact that few of the men remain strictly at the one type of work, but move about from mine to mine or frequently leave the mines for other occupations. As the mining industry develops to larger proportions in this camp this factor will lessen and the rate of incidence tend to increase. The incidence will be lessened by the discontinuance of the dry drill which has been effected by the Mines Inspection staff of the Province. Further, through their efforts the large mines are now kept sufficiently wet and have provision for adequate ventilation.

EMPYEMA*

ALFRED J. GRANT, M.D., F.A.C.S.

Instructor in Surgery, University of Western Ontario, London

IN discussing the subject of empyema we must not lose sight of the fact that the condition is often but a local manifestation of a constitutional disease. We recognize the ordinary type of the disease which so frequently follows lobar pneumonia, by a direct extension of the infective process from the lung to the over-lying pleura, developing into a localized area of pus, which usually shows itself after the pneumonic process has subsided. This condition carries with it a low mortality, if early recognized and promptly treated. We also recognize the more severe types of empyema of streptococcal and staphylococcal origin, as well as the pneumococcal infections following a secondary or a broncho-pneumonia co-incident with or following influenza, measles and other

focus or lung abscess producing the condition of pyopneumothorax is among the possibilities, and much is being written upon this condition following the now very frequent operation of tonsillectomy. That lung abscess following tonsillectomy is not entirely of aspiration origin is well borne out by the fact that many cases have followed the operation under local anaesthesia, so that we must think of embolic origin as a possibility. Some interesting cases of this type were recently discussed at the Philadelphia Academy of Surgery. We also have the latent tuberculous empyema which we see quite frequently.

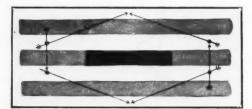


Fig. II.

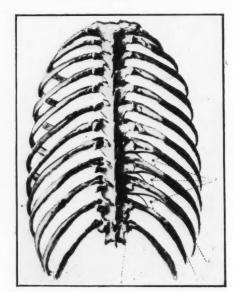


Fig. III.



Fig. I.

infectious diseases. The exudate is often very extensive and may surround the lung; it may become encapsulated where access is difficult and may be multilocular because of many adhesions. Perforation of an intra-pulmonary

^{*}Read at the annual meeting of the Canadian Medical Association, Ottawa, June, 1924.

Early recognition of empyema is perhaps the most important factor in the treatment of the disease. In a series of 455 cases compiled at Johns Hopkins Hospital and recently reviewed:

Two hundred and thirteen had symptoms for one to four weeks before entering hospital.

Eighty-one had symptoms for one to three months before entering hospital.

Forty had symptoms for three to six months before entering hospital.

Twenty-one had symptoms for six to twelve months before entering hospital.

Only 50 per cent had been promptly recognized.

Ten per cent of the entire series had serious complications in addition to empyema, pulmonary abscess, septicaemia, general peritonitis, suppurative pericarditis and bronchial fistula being among the more serious. Seventyfive per cent of the total mortality belonged to this group with serious complications when the empyema was recognized. Whether we consider this synopsis of 455 cases at Johns Hopkins as an average state of affairs or not, we must admit the fact that localized empyema is not by any means easy to diagnose, and the case without the much to be desired classical signs and symptoms is the rule rather than the exception. In addition to the procedure of exploratory puncture, stereoscopic x-ray plates are perhaps our greatest aid in the diagnosis of obscure cases. Among all the suppurative processes empyema probably should be accorded first place in tendency to chronicity. Convalescent pneumonia patients may carry pus for months without temperature, and the lung may remain collapsed after the empyema has been evacuated.

There is no one particular line of treatment which can be applied to all cases of empyema. We must handle the case upon its merits and meet indications as we find them. I believe that early aspiration in cases with a large amount of sero-purulent fluid, with perhaps coexisting active disease in the lungs, has saved many lives, while it is generally agreed that any form of open operation at this stage is contra-indicated. Adhesions have not yet formed and the danger of acute pneumothorax is a real danger, if an opening is made at this time. Aspiration does not cure these cases but it relieves symptoms, makes the patient breathe

easier and may be repeated upon several occasions with benefit to the patient. The mortality in such cases is high and those who survive the initial process usually require a radical open operation for the empyema before going on to complete recovery.

The methods of closed drainage in use, either continuous or intermittent, have not given as good results in my hands as the open method. I am well aware of the fact that some excellent results are being obtained by closed methods but it seems to me that the possibility of inadequate drainage and the inability to dispose of clots of fibrin, together with the more or less complicated apparatus required are all considerations against the closed method. In my experience, recurrences are more common when the closed method has been used. One legitimate field for the closed method is found in septic cases where the presence of the infected fluid is a great menace to the patient. Simple thoracotomy with trocar and canula, passing a catheter through the canula and connecting the same with a bottle is good surgery is such cases, but like those suitable for repeated aspiration I believe that the most of them will require ultimate radical open drainage.

In the presence of frank pus, properly walled off by adhesions, the considerations for treatment are summed up in the words adequate drainage, properly maintained. Simple incision in an intercostal space may provide such drainage is some cases, but which of us has not seen cases of empyema drained by this method which ultimately had to be subjected to further incisions and often rib resection before the cavity would close. The following compilation of cases from the Children's Hospital, Philadelphia, is of interest in this connection:-171 cases of rib resection, 40 per cent cured, 35 per cent improved, 21 per cent died; 54 cases of simple incision, 16 per cent cured, 37 per cent improved, 40 per cent died. Returned for second operation, resection 10 per cent, incision 16 per cent.

Conclusions.—Best results were obtained by aspiration to remove sufficient fluid to relieve symptoms until adhesions form. Then drainage by rib resection and rubber tube.

If we recognize the necessity for adequate drainage, resection of a portion of a rib, or ribs is one sure way of providing such drainage. As these patients take general anaesthetics badly, the operation comes logically into the field of local anaesthesia.

To assure a simple procedure, without serious inconvenience to all concerned, it is necessary that our technique should be very smooth, and you will, perhaps, forgive a few details in this connection which will seem very elementary to many of those present. Preliminary morphia, a safe anaesthetic which may be used freely, a liberal field of anaesthesia, sharp dissection without much traction upon the parts and gentle manipulations at all stages of the operation are among the most important considerations, while the "handling of the patient" from a psychic standpoint is not by any means to be despised as an adjunct to success.

With the assistance of a few slides I would like to touch upon a few details in technique.

Using one-half per cent novocain with 1-100,000 suprarenin the superficial injection maps out a rectangular area of skin over a portion of rib to be resected. Deep injections are now made in the intercostal spaces above and below the site of resection, at the four points shown, two anterior and two posterior to the portion of rib to be removed. The deep injections are carried right down to the pleura and a liberal quantity of solution is used so that both branches of the intercostal nerves will be included in the field. A wait of five minutes follows the complete injection. The only step in the technique of the operation proper which I wish to mention, is the method of making

the first cut through the rib. I have tried many methods under local anaesthesia and have found a very sharp thin chisel to be the best instrument for this purpose. By having an assistant steady the rib by lifting upon the lower margin with a flat periosteal elevator it is a very simple matter to go through the bone with chisel and mailet without causing the patient any pain. Once the break in the contour of the rib is made by the first cut, the rib shears may be used to remove the section of bone without inconvenience to the patient. Any attempt to push the point of the shears or that of a pair of bone forceps beneath the rib, in order to make the first cut is very liable to cause considerable pain. After the removal of the piece of bone the pleura may be incised quite painlessly because it has been included in the deep injection. The insertion of a good sized rubber tube covered with ordinary absorbent dressings completes the operation.

I have seldom found it necessary to use Dakin's or any other antiseptic solution in the treatment of reasonably recent cases, but I am ready to admit the fact that I have sometimes used every variety of solution known to the art of man in the attempt to heal a chronic empyema before resorting to a more or less mutilating operation.

The treatment of recurrent and persistent empyema has already been presented by my colleagues.

REFERENCE

(1) Annals of Surgery, vol. 79, page 608.

On Gastro-Enterostomy. — At the present time, in the opinion of Donald C. Balfour, Rochester, Minn., there is no conclusive evidence that any operation is more useful than gastro-enterostomy in cases of chronic duodenal ulcer, except in carefully selected cases. Although partial gastreetomy may be indicated in cases in which there is a persistent recurrence of the ulcer after gastro-enterostomy, since this recurrence is certainly not over 3 per cent., it would be difficult to justify partial gastreetomy in 100 cases of non-malignant disease in order to prevent such a small per-

centage of recurrence, particularly when such recurrence can be satisfactorily dealt with by secondary operation. Gastro-enterostomy is not destructive. The operation, in suitable cases, can be depended on to give excellent and permanent results in more than 90 per cent. of the cases; and it has a distinct advantage over all other operations for peptic ulcer in that after the ulcer has completely healed, the anastomosis may be disconnected with ease and safety, if desired.—Jour. Am. Med. Ass., Aug. 24, 1924.

EMPYEMA—ACUTE AND CHRONIC*

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WITH the time at our disposal for this symposium on empyema, it will be impossible to deal with the subject fully. The author proposes to briefly outline the present methods of treatment, the results obtained, and to present statistics of a group of patients who have been followed for some years, hoping that the discussion will bring out the essential factors in the diagnosis, treatment, prognosis and aftercare, as we now recognize them.

We all recall the great dread with which we observed the development of an acute empyema, the alarming febrile reaction, the grave consultations as to the advisability and time for operative interference, the appalling mortality, and the large percentage of chronic empyemas resulting, with the long, drawn-out convalescence, the distressing sequelae, and the repeated operations necessary for the final obliteration or closure of the cavity in the chronic stage of the disease.

Hippocrates was the first to recognize the disease. He advised intercostal incision or rib resection for drainage. He wrote a treatise on the subject that was as lucid as anything that appeared until the last decade. During the years 1915-1920, as a result of intensive study of hundreds of men wounded in the thorax during the War, and the dreadful epidemic of influenza, thoracic surgery generally developed to a greater extent than it had in all previous time. Before the War it was recognized that if thorough drainage was secured, little else was required to effect a cure in empyema That such treatment was not always efficiently carried out was borne out by the constant number of patients suffering from chronic empyema, emaciated, anaemic, deformed and mutilated, who were to be found in all our large hospital clinics. The high mortality (50-70 per cent in children, and 20-30 per cent in adults) impressed us with the gravity of the disease

and the inadequacy of the treatment employed. As a result of the closer study of the disease during the War, measures were established that reduced our mortality, which, during the influenza epidemic was commonly as high as 50 per cent, and in some areas 70 per cent, to almost nil in acute cases; the incidence of chronic empyema to a very low mark, and the total death rate to approximately 2 per cent. Mutilating operations, such as the Schede and Estlander, are now rarely necessary, and reexpansion and complete function of the collapsed lung can be obtained in the vast majority of patients.

The profession generally should recognize that aspiration for the diagnosis of acute empyema is rarely necessary; it should not be too early resorted to in the developing empyema, and then only with the greatest care to avoid collapse of a lung that is not yet sufficiently firmly adherent to the chest wall. Apart from the straw-coloured fluid found in tuberculous pleurisy, if the fluid in the syringe is clear and flows freely, we have aspirated too early, and except to relieve dyspnoea, no more than a few cubic centimetres of fluid should be taken off at that time. It is astounding and inexplicable how rapidly absorption of even fairly thick fluid occurs within the thorax, and no one can state how much, or how little, or how soon, or how late absorption may occur. Guided by the elevation of temperature, pulse and respiratory rate, the degree of dyspnoea, the displacement of the heart, and the toxic condition of the patient generally, the surgeon should delay aspiration until the empyema is well walled off, and the lung about it firmly adherent to the chest wall, so that if air does enter the cavity, or if the walls of the cavity tend to collapse as the fluid is aspirated, the adherent parietal and visceral pleurae do not separate. If aspiration is performed too early this localized empyema cavity, which was pocketed, and could easily have been dealt with,

^{*}This paper was read at the Annual Meeting of the Canadian Medical Association, Ottawa, June, 1924.

becomes transformed into a general empyema, occupying a large cavity in the thorax, with its attending added area for absorption and increased problems of obliteration. Undoubtedly many patients who have had a small, self-limiting pocket of pus, that would have continued to wall off and absorb or perhaps rupture into a bronchus and be spat up, have, by too early or careless aspiration, developed an extensive empyema, with all its dreadful sequelae.

Bear in mind that the fluid is first a protection to splint the lung, and stabilize the mediastinum, and that the early deaths are not due to absorption of the fluid per se, but in the majority of patients, to too early interference with the fluid, collapse of the small remaining air-bearing portion of lung tissue, and insufficient oxygenation. Death results not from the disease itself, but from injudicious interference by the medical or surgical attendant. If after repeated aspirations the patient is not improving or holding his own, closed drainage should be employed by inserting a catheter in a dependent interspace, employing the trocar and canula method.

Intercostal incision, or rib resection should not be employed until after repeated aspirations and a thorough trial of closed drainage, the patient is no longer improving. When an operation is undertaken it should be sufficiently radical to allow for sufficient exploration of the thorax so that a mediastinal or interlobar collection may not be overlooked. This exploration can readily be done through an intercostal incision. While the chest is open, a lower, more dependent, intercostal incision can be made, drainage instituted through that opening, and the primary incision closed and hermetically sealed. In a certain percentage of cases, where there is no pocketing, and the patient is hospitalized and under close observation and can be frequently fluoroscoped if necessary, the incision may be closed by primary suture, and repeated aspirations carried out until the exudate ceases.

Local anaesthesia, or modified paravertebral, associated, if necessary with gas and oxygen analgesia, or better, ethylene analgesia, should be employed for all operative measures to secure drainage of the fluid in acute empyema.

Chronic Empyema.-We must look upon

chronic empyema as an improperly treated acute empyema. Three reasons may be given for an acute empyema becoming chronic; either it is a neglected case and has not had surgical attention when it should have had it, or it has been badly operated upon, or the after-care has been poorly managed. Lack of co-operation on the part of the patient may contribute almost as much to a bad result as injudicious treatment by the medical attendant.

Once an acute empyema has become chronic, we must not be unduly hurried in dealing radically with the cavity. Radical operation should only be undertaken after the exact size, nature, and accurate ramifications of the cavity have been determined, and when, after a thorough trial with Dakin's solution, the application of various dyes, blowing exercises, and suction, etc., the cavity is no longer obliterating. Operation should not be delayed, however, after the cavity has reduced as much as it is apparently going to with palliative measures, and once the patient's general condition has improved as much as we can expect it to, with the thorax still draining.

Briefly the causes for persistent drainage in these cases are:—(1) Necrosis of the bone or cartilage adjacent to the sinus; (2) A sequestrum, or other foreign body within the cavity; (3) A drainage opening that is no longer dependent; (4) Fibrosis about a bottle-shaped opening into the cavity that cannot heal; (5) Multiple pockets within the cavity that do not drain dependently; (6) Such extensive thickening over the visceral pleura that the partially collapsed lung cannot expand further; (7) Adhesions to the diaphragm or pericardium; (8) Tuberculosis, syphilis, pyocyaneous infection, and actinomycosis.

With all cavities which contain over three ounces, effort should be made to re-expand the lung to occupy the cavity. In most of the cavities under three ounces, especially if peripherally placed, closure by muscle or skin flap, moderate resection of the chest wall, or some allied method, is advisable.

In patients with cavities larger than three ounces, the vital capacity of the lung is so reduced that every effort should be made to expand the collapsed portion, thereby restoring the air-bearing capacity of the lungs, and, as well, obliterating the cavity. Decortication

carefully performed, when followed by complete expansion of the collapsed portion of the lung, is one of the most satisfactory operations in modern surgery. The operation unfortunately in inexperienced hands, or in the hands of the surgeon who only occasionally is called upon to deal with a patient requiring such an operation is an extremely difficult procedure fraught with dangerous possibilities and sequelae.

Unfortunately such operations as a modified Estlander and Schede are still necessary to obliterate the cavity, in a certain percentage of patients. However, with our present technique and selected anaesthesia, the complications and dangers of such mutilating procedures have been reduced to a minimum.

There are still large numbers of patients suffering from chronic empyema who have gone on for months or years, still draining. Having accurately determined the exact location and extent of the cavity, it is surprising the ease and despatch with which we are now able to obliterate the cavity and return the patient to health, with but little morbidity, and with a mortality of not more than 10 per cent.

Summary

1.—The incidence of acute empyema is about three times as common in males as females and except in traumatic cases, is as yet beyond the control of the medical attendant.

2.—Apart from postural rest, inclining the patient on the affected side, or limited strapping of the involved side, the chest should not be tampered with in the developing stage of the disease.

3.—Aspiration for diagnosis is rarely necessary.

4.—Guided by the elevation of temperature, pulse and respiratory rate, the degree of dyspnoea, the displacement of the heart, and the toxic condition of the patient, generally, aspiration should be delayed until the fluid is well walled off, and the lung about it firmly adherent to the chest wall.

5.—If aspiration is employed therapeutically it should be resorted to at least every thirty-six hours depending upon the febrile reaction of the patient.

6.—Intercostal incision or rib resection for drainage should only be employed after repeated aspirations of some form of closed drainage has failed to cure the disease.

7.—Chronic empyema must be looked upon as the disastrous sequelae of a mismanaged acute empyema.

8.—Radical interference with a chronic empyema cavity should only be undertaken after palliative measures have failed to obliterate the cavity.

9.—Our aim should be to bring the collapsed lung out to the chest wall rather than to collapse the chest wall to the lung.

10.—Above all we should constantly keep in mind that a combined mortality of more than 2 per cent is not due to the disease per se, but in most instances to too early, too radical, and injudicious interference generally by the medical or surgical attendant. It is better to have a live patient with a draining sinus than a dead one with the chest closed. Above all, keep them alive.

Treatment of Pruritus Ani, Vulvae and Scroti.

—The technique employed by M. P. Moorer, Asheville, N. C., in the treatment of these cases consists in rendering the part clean with water, of good soap and a soft sponge; application of a solution of mercurochrome-220 soluble as an antiseptic, and the injection of a small area with 1 per cent. procain as a starter. The remainder of the diseased skin is then infiltrated, after which the underlying subcutaneous structure is ballooned out with quinine and urea

hydrochlorid solution until the patient complains on resuming a chair that he is "sitting on a cushion." The pressure on the terminal nerves produced by the forcible injection of fluid in large amount brings about a temporary paralysis equal in duration to that produced by severance of their filaments with a knife, and to the mind of the average patient is much more acceptable.—Jour. Am. Med. Ass., Sept. 6, 1924.

DIETETICS IN THE TREATMENT OF THE DIABETIC PATIENT

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IN a previous paper1 the principles underlying the dietetic treatment of diabetes mellitus were discussed and illustrated, and a method of deriving a suitable dietetic prescription for the patient demonstrated. Further experience, both in Toronto and elsewhere, has confirmed the value of the methods of treatment advocated. The object of the present paper is to illustrate the production of a suitable menu from a dietetic prescription and to discuss further certain problems in the dietetic treatment of diabetes.

The diabetic diet should be made, as far as possible, from easily available, seasonable foods along the lines of a normal diet. It is much more satisfactory for the patient to obtain from among these natural foods at least the essentials of his diet than to be dependent entirely upon specially prepared diabetic foods. The latter are not only expensive but their obligatory use is an unnecessary and irksome social and business restriction which tends to make him dissatisfied with his treatment.

Consideration of a normal diet shows that it is commonly made up much as follows:-

Breakfast:

Fruit, e.g., grapefruit, oranges, etc. Protein foods-eggs, bacon, fish. Cereal foods-porridge, bread. Fats-cream, butter.

Non-nutrient substances-coffee, tea, etc.

Lunch: Soup.

Protein food-meats, eggs, fish, etc. Vegetables-potatoes, carrots, lettuce, beets, etc. Fats-cream, butter, mayonnaise dressing. Desserts-custards, pies, fruit, fruit salad, etc. Non-nutrients-tea, coffee, condiments.

Similar in composition to lunch.

Monotony of diet furnishes one of the principal reasons why patients discontinue treatment. Yet it is astonishing to find how few alterations in diet satisfy the normal healthy individual, a few changes sufficing to break the monotony. Diabetic patients should be specially trained and even urged to make for themselves the necessary changes in their diet.

In the following tables (Tables I and II) are arranged a number of foods in common use with their approximate composition in protein, fat and carbohydrate, with weights and measures and other information useful to the diabetic. Table I, which has been somewhat extended from a similar table by Joslin, classifies the vegetables and fruits according to their carborydrate content. It will be noted that the 5% and 10% vegetables are reckoned as containing 3% and 6% of carbohydrate, whether raw or cooked. There is considerable variation in the actual carbohydrate content of these vegetables in different years and at different periods of growth and when grown on different land. Where, however, the diet includes several vegetables the average available carbohydrate content is sufficiently accurate. No attempt is made to calculate their actual protein content as it is comparatively small in amount and no accurate data exist. Attention may be specially directed to a list of non-nutrient substances including mushrooms, broths and mineral oil mayonnaise, which make most desirable additions to the diabetic dietary. Table II shows the protein, fat and carbohydrate content of various foods in a state ready to serve. Considerable variation in the protein and fat content of cooked meats may be expected, owing in part to their original composition, the size of the raw portion, and the method of cooking employed. Many of the values given have been derived from standard works on dietetics; others are from our own analyses.

See Tables I and II.

Although the actual construction of a diet is time-consuming, and, at first, appears difficult, with a knowledge of the food value of the commoner foodstuffs and a little practice in arranging a diet the difficulty largely disappears. Worked out as suggested in the previous paper, the basal dietetic prescription for a male patient 50 to 60 years of age, 5 feet 11

TABLE I Approximate Carbohydrate Content of Vegetables and Fruits

	5%	10%	15%	. 20%	No	n- $Nutr$	ients	
Lettuce Cucumbers	Tomatoes Brussels sprouts	Onions Squash	*Green peas Artichokes	Potatoes *Shell beans	Broths Bouillon	eubes		
Spinach Asparagus	Water cress Sea Kale	Turnip Carrots	Parsnips *Canned	*Baked beans	Tea, coffe			
Rhubarb Endive	Cauliflower Egg plant	Beets Kohirabi	lima beans	*Green corn	Cracked			
Marrow Sorrel	Cabbage Radishes	Pumpkin		*Boiled rice	Mushroon Salt Peppe Sage Spic	er		
Sauerkraut Beet greens Dandelion	Leeks String beans Broccoli	*Canned green peas		*Boiled mac-	Thrice b	oiled	5%	
Swiss chard Celery	Macedoine	Okra *Sov beans		arom	Agar jell			
Unsweetened pickled vegetables		Horseradish			Mineral		onnais	se
Twice boiled carrots beets						nd moss	88	
" " onions turnips.						-		
Ripe olives (contain 20% Grapefruit Reckon available carbos 3% (3 gms. of carbohy vegetables).	in 5% group as	Lemons Oranges Cranberries Strawberries Blackberries Gooseberries Peaches	Apples Pears Apricots Blueberries Cherries Currants Raspberries	*Bananas Prunes	Measures 30 gms. c gms. = 1 1,000 cc orie of tempera water 1	kilogra .=1 lit heat ture of	am = 2. re. 1 raises f a lit	cal the
Carbohydrates in 10% oned as 6 gms. per 100	Pineapple Watermelon	Huckleberrie	28	protein calories. 9 calorie	. 1 gm			
The percentage of carbo as indicated in the tab	hydrates in fruits is				9 calori	20		
Count clear soups and c 1 gm. carbohydrate pe *Denotes foods with cor or fat. See Table II	r 100 c.c.	apples dried prunes and peaches Peaches can- ned in water						,
inches tall and we	eighing 154 pour	nds, should				P.	F.	0
contain 1,692 calori	es. Approximat	ely this will	Fruit 5% Gr		150 gm.			7.
be supplied by prot	ein 47 gm., fat 1	Erros 2 nos			12	12		

be supplied by protein 47 gm., fat 146 gm., car bohydrate 41 gm.; if the food is divided equally between the three meals, P. 16, F. 49, C. 13 is the allowance per meal. To prevent ketosis during the early morning hours it is often useful to transfer a portion of the carbohydrate from breakfast to the evening meal. As the fats can be easily adjusted by varying the butter allowance, greater consideration is given to the carbohydrate and next to the protein content of the foods. With the outline of a normal diet in mind, one proceeds to construct a diet for the patient in terms of the foodstuffs.

Breakfast.—One hundred and fifty grams of grapefruit or 75 gm. of orange or peaches contains 7.5 gm. of carbohydrate. Two eggs will contain 12 gm. of protein and 12 gm. of fat in Twenty grams of lightly cooked breakfast bacon will contain approximately 3 gm. of protein and 8 gm. of fat. The patient's diet now stands:

Fruit 5% Grapefruit or 10% oranges	150 gm.	P	F. 	7.5
Eggs, 2 poached Bacon, cooked	20 gm.	3	8	
		15	20	7.5

Fifty cubic centimeters (1 2/3 ounces) of 32% cream (whipping cream) will supply one gram additional protein, 16 gm. of fat and 1.9 gm. of lactose, making the total of P. 16, F. 35, and C. 9.4 gm. The protein is suitable in amount; the fat can be balanced by adding butter (15 gm.); and the carbohydrate is somewhat less than one-third the day's allowance. Tea, coffee, or cracked cocoa, bran cakes and, if necessary, agar jelly are added to provide extra bulk.

Lunch.—Using the outline given for the noon meal, suitable quantities of the different foods are set down as for the breakfast. When 150 or more grams of fat are to be served it is useful to prescribe at least one cream soup, containing 30 to 60 cc. of cream and 50 gm.

TABLE II

FOOD VALUES

Average Amount per 100 Gms. Unless Otherwise Stated

Food	P.	F. (C.	Food	P.	F.	C.
Bread, white	0			Halibut, boiled	21	4	
Rolls	9		55	Salmon, boiled		10	
Shredded Wheat biscuit (1)	3		23	" canned	20	10	
Cream of Wheat, dry	13		85	Sardines, canned	23	20	
Oatmeal, dry			-	Trout brook, boiled	21	2	
Rolled Oats	16	7	67	" lake, raw	18	10	
Rice, dry	8		79	Whitefish, raw	22	7	
" boiled	3		24	Lobster, raw	16	1	
Macaroni, dry	13		75	Oyster, solids	6	1	3
" boiled	3	1.5	16	Shrimp, canned	25	î	
Egg (1)	6	6		Milk, whole	3	Ā	5
Roast beef	-	-		" skimmed	3	- 1	
Pressed beef	23	28		Cream, 16%	2.7	16	3.8
Boiled beef	25	23		(1 2007	2.5	21	3.8
Steak, tenderloin	23	20		" 20% " 24%	2.2	24	3.8
	27					32	3.8
" round, lean		8		" 32%	1 2		3.8
SITIOIII	24	10		40%	1.8	39	3.6
Corned beef, canned	26	19		Cheese, domestic	28	38	
Beef tongue, canned	20	23	* *	" cottage	20		4
** 1 1 11 11		-		Butter		85	
Veal, raw, leg, cutlet, loin	20	7		Oleo		00	
" roasted	28	1		Olive Oil			
Mutton, roast	26	22		Salad Oil		100	
" boiled, lean	31	5		Cooking fat			
" chop, lean	22	5	2.	Almonds, beechnuts	21	55	1
Lamb, roast leg	20	13		Brazil nuts	17	67	1
* " chops, broiled	22	30		Peanuts	26	39	22
Pork, roast, lean	28	10		Peanut butter	29	46	17
" chop, lean	26	6		Filberts, Hickory nuts	15	66	13
" chop, fat	18	39		Pecans	10	70	1.
" steak	30	45		Walnuts	18	65	13
Bacon, average raw	10	67		Dried peas, uncooked	25	1	5
" cooked medium	15	40		Dried beans, "	22	2	5.
Ham, boiled, smoked	20	22		Dried soy beans, "	38	15	
" fried	22	33		Green peas, cooked	5		1
Chicken, roast, young	25	5		Green corn, "	3	1	19
" hroilers ran	22	2		Banana (1)	1	-	20
" broilers, raw		16				* * *	18
run grown		10	* *	Potato	5	5	10
Bass, raw	19	1		Meat and vegetable stew	9	9	•
Cod and Haddock, boiled	22						

Values are for edible portion cooked or ready to serve except as indicated. For convenience fractions of a gram are omitted.
*With bone.

5 per cent vegetables, in the day. If cold meat is to be served the 5 per cent vegetables (150-300 gm.) are served best as a salad with a mayonnaise dressing made with olive oil, or corn oil. In cases where constipation is a complication of the diabetes, liquid petroleum may be used in making the mayonnaise. For a cold lunch one may use a somewhat smaller portion of meat than when it is to be served hot, and the protein saved may be used in making a custard with eggs and milk or cream. Butter and cream together with non-nutrients may be added in suitable quantities.

Supper.—In the evening meal hot meats and hot vegetables will usually be served. The general composition of the diet will be similar to the noon meal. A fruit salad may be used as a dessert or fresh sliced fruits or fruits canned in water may be served. To sweeten the fruit a half grain of saccharin is dissolved in

50 cc. of cream and the latter poured over the fruit after being whipped.

The following is the dietetic prescription completely worked out:

compressory wormen or				
Food	AMOUNT	P.	F.	C.
Ration			146	41
Meal			49	13+
Br	eakfast			
Grapefruitor Orange	150 gm.		• • • •	7.5
Eggs	2	12	12	
Bacon, cooked	20 "	3	8	
Cream, 32%	50 c.c.	1	16	1.9
Butter	15 gm.		12.7	
Tea, coffee, bran cakes		16	48.7	9.7
1	Lunch			
Soup Cream, 32%	50 c.c. 50 gm.	1	16	3.4
Boiled Ham	40 "	8	8.8	
Salad (radish, lettuce, to-				
mato, cucumber	170 "			5.1
Custard (recipe below)	1	4.5	5	4
Cream, 32%	50 c.c.	1	16	1.9
Butter	10 gm.		8.5	
Tea or coffee, bran cakes	, agar jelly,			
mineral oil mayonnaise		14.5	54.3	14.4

Dinner			
Soup, clear	13.8	16.8	1
Vegetables, asparagus 100 gm. marrow 100 gm. Fruit, 10% 85 gm.			6 8.5
Cream, 32% 50 c.c. Butter 12 gm.	1	$\begin{array}{c} 16 \\ 10.2 \end{array}$	1.9
Tea or coffee, bran cakes, agar jelly	14.8	43.0	17.4
Extra 10 gm, cottage cheese with sal	45.3 lad 2	146.	41.2

In constructing the first draft of a menu it is unnecessary to use up all the protein, fat or carbohydrate assigned to any one meal, in that meal. Some slight latitude may be allowed if the whole day's ration approximates the correct total. Indeed it is often somewhat better to use slightly less than the prescribed amount of food, leaving a margin to be used as extras to vary the diet. Vegetable salad tastes very different when enriched by the addition of a portion of lobster, a ball of cottage cheese, a sardine or a shrimp, or a small slice of Canadian cheese. Salted almonds or chopped nuts may be added to a fruit salad. The actual caloric value of these extras is almost inconsiderable, but they are of immense importance in increasing the palatability of the diet. In cases where the same foods occur in more than one meal (cream, butter, etc.) the weighing for the day is done before breakfast and suitable division of the food for the three meals can then be made.

The next problem arising will be the substitution of other articles of food for those occurring in the draft menu in order to avoid monotony of diet. The same quantity of any other 5 per cent vegetable (see Table I) may be substituted for those listed, or half as much 10 per cent vegetable may be substituted for the 5 per cent. Meats are substituted on the basis of their protein content; e.g. 60 gm. roast beef containing 13.8 gm. protein may be replaced by (1) 55 gm. roast young chicken, or (2) 51 gm. lean roast pork, or (3) 51 gms. roast veal, or (4) 69 gm. of roast leg of lamb. In each case the fat content will vary somewhat from the value originally calculated (16.8 gm.) The difference is adjusted by subtracting from the butter allowance or by adding sufficient

butter (85 per cent fat), olive oil, salad oil or cooking oil (100 per cent fat) as necessary. 14, 11.8, 16.3 and 7.8 grams respectively of additional fat are required in substituting the above meats for the roast beef on the menu. Where a food containing protein and fat and carbohydrate is to be used as an alteration in diet substitute it for a carbohydrate-containing food adjusting the protein and fat content of the diet by increasing or decreasing the meat and butter as necessary. Simple variations in a diabetic diet are learned without difficulty by making and writing down one variation per day. During the growing season care should be taken to use freely of the more perishable foods, leaving those which are easily preserved for winter consumption.

A basal maintenance diet only provides the energy required by the patient at rest. Additional food will be required if the patient is to return to his work. The increase in food intake is best made gradually, and the effect on glycosuria and the blood sugar observed. Five grams of carbohydrate and 20 grams of fat is a suitable quantity in many cases. One hundred grams 5 per cent vegetables, 50 cc. 32 per cent cream, and 5 grams of butter may be used. The gram of protein in the cream may be allowed for by cutting out the 10 gm. of cottage cheese. With slow successive increases, with or without insulin, the character of the diet is gradually altered, new foods becoming available with the rising carbohydrate allowance. If, for instance, the above basal diet is to be raised to P. 47, F. 186, C. 51, a 15 gm. portion of oatmeal (weighed dry) may be introduced. This will contain P. 2.4, F. 1, C. 10 gm. Decrease the grapefruit allowed to 100 gm., discontinue the cottage cheese and add 75 cc. 32 per cent cream which equals P. 1.5, F. 24, C. 2.9. Decrease the roast beef to 50 gm. to balance the protein and add 22 gm. of butter to balance the fat. Another method of altering the original menu would be to discontinue the grapefruit and the cottage cheese and add to the breakfast 15 gm. oatmeal (weighed dry) and 125 gm. 5 per cent vegetable, e.g. fried vegetable marrow or tomatoes, and increase the daily allowance of cream by 100 cc. and of butter by 10 gm. Increase in the protein allowed is not necessary for the performance of work. When one constituent of the diet is

noticeably small relatively to the other, however, there is a certain difficulty in balancing the diet. For this reason, when the caloric increase is approximating the requirement for work it is desirable to increase the protein of the diet. This is most simply done by increasing the amount of meat allowed during the day and rebalancing the fat by adding or subtracting from the butter allowance. More elaborate made dishes may be introduced into the diet when the patient has shown himself capable of calculating the simpler diets.

As, in the diabetic dietary, many of our cheaper staple foods are prohibited or, at least, greatly restricted, the patient's food becomes more costly than the diet of the average normal person. In some instances, it will be necessary to consider the expense in constructing his diet. The diabetic who regains his earning power, should be advised to spend liberally for his own food and thus avoid the monotony of diet and dissatisfaction attendant upon the use of the cheapest available foods. Intelligent marketing will help to solve the problem, but, in case the poorer qualities of food are inevitable, much may be done by suitable culinary methods to make them palatable. alternation of the foods, the employment of different methods of cooking, roasting, pot roasting, baking, frying, broiling, boiling, steaming, the use of seasoning agents, etc., may be invoked to improve the flavour of the cheaper foods. Lack of knowledge, time, and care in the preparation of the food rather than its quality is the essential cause of dissatisfaction with most meals.

Insufficient attention has been paid to the value of non-nutrient substances in the diabetic dietary. In reality one depends upon these substances to a considerable extent for flavouring the food and tempting the appetite. In many undernourished cases of diabetes the bulk of these substances gives a comforting sense of fullness after meals, which definitely contributes to the feeling of well-being of the patient. In addition, however, the severe diabetic showing glycosuria tends to become dehydrated and thereby suffers from marked The unabsorbable residues of constipation. these non-nutrient foods tends to relieve this condition. When the diet has been increased

to a sufficient amount the bulk may be decreased with advantage.

The introduction of insulin permits the severe diabetic to make use of a more satisfactory diet than formerly. While it does not confer a power of unrestricted choice on the patient it is now probably unwise to feed him less than 50 gms. of carbohydrate per day over long periods of time. On such a diet oatmeal may be used. Ten grams of carbohydrate are contained in a small portion (15 gms. dry weight) and this forms a satisfying addition to the menu. If desired, some washed bran may be added during the cooking to increase the bulk. The amount of bread allowable to severe diabetics is only an aggravation. would agree with Joslin that the severe diabetic should forget the taste of bread. The nonnutrient bran cake (recipe given below) is very palatable and furnishes a vehicle for the butter If consumed in excessively large amounts, however, it leads to discomfort from intestinal fermentation. Provided the expense is not a barrier, "Cellu" flour may be mixed with the washed bran. In less severe cases (carbohydrate tolerance of 70 gms. or more) small amounts of bread may be allowed with advantage if the patient be carefully supervised. White bread is preferable to brown bread since cane sugar and molasses is often used in the latter. Several preparations made from soy bean or casein are on the market. These make rather palatable bread substitutes but have the disadvantage of very high protein content. Most patients abandon them for an equivalent amount of meat. Gluten flour has a limited value in the milder cases of diabetes. Its protein content is rather high and the carbohydrate content very uncertain. If used, the flour may be mixed with washed bran and made into muffins which are fairly palatable.

Consideration must be given to the age of the patient in arriving at a suitable diet prescription for an individual, and other diseases must be considered in relation to their influence on the patient's condition. It is usually inadvisable to make radical changes in the diet of aged patients, especially if they are severe diabetics under their normal weight. The protein should not be too severely restricted in cases associated with myocardial incompensation. In these two groups of patients 20 grams

more protein per day than usual is allowed. A third requirement for increased protein in the diet occurs in the child during the growth period. Here protein is required in larger amounts not only to replace more rapidly catabolizing tissue protein, but also to permit of growth of the child. If used for the latter purpose alone there seems no reason to believe that this protein per se increases the insulin requirement. Indirectly, however, by increasing the size of the child and providing a larger mass to be transported, kept warm, and supplied with nutriment, an increase in the internal secretion of the pancreas becomes necessary and due consideration should be given this factor in treating diabetic children. The quantity of protein allowed in our cases varies also somewhat with the age, from 1-2.5 grams per kg. body weight.

Instances of true chronic inflammatory renal disease associated with diabetics are, in the opinion of the writer, much less common than the literature would lead one to expect. The diagnosis has usually rested upon the presence of albumin, with raised blood-pressure, or cardiac enlargement; none of which are necessarily indicative of nephritis. When the latter is a real factor the limitations of his kidney function will have to be taken into account in treating the patient. The usual protein allowance (2/3 gm. per kilo) is advisable in those cases showing a tendency to nitrogen retention. In other instances, where difficulty in excreting fluids and mineral salts are prominent factors, a limitation of the bulk of the food will be required. The more concentrated carbohydrate foods can be employed, thus limiting both salt and water intake. Infections in diabetic patients are always best treated on a diet liberal in protein, carbohydrate and calories, even if insulin should be required to keep blood sugar normal.

A diabetic patient should be taught at least the essential facts about his disease, how to construct his own menus, how to prepare the less familiar foods, how to test the urine for sugar and diacetic acid, and how to weigh his food. Several suitable scales can now be procured with which the weighing of the food can be done with a minimum of trouble. The advantages gained are not alone the exactitude in the patient's intake of food; the mental discipline and training increases the patient's morale.

He early observes the effect of relaxing his vigilance and learns to obey the restrictions necessary for the treatment of his condition. The treatment of severe diabetics without weighed diets is disastrous. A relatively short experience will convince any competent observer of this fact. Mild cases may, it is true, be able to remain sugar free on a qualitatively restricted or even a guessed diet, but in such cases there is a great tendency to exceed the limitations and to neglect urinary examinations, etc. Unless kept under careful observation a patient may persuade himself that he is cured and relax all restrictions. The loosely treated diabetic is a menace not only to himself but to other diabetics with whom he comes in contact.

Many substitutes have been devised for the diabetic menu. The following recipes are among the most useful:*

TO WASH BRAN

Buy unprepared feed bran. Sift to remove remaining flour. Half fill a cotton sack and tie firmly at the top; leave under running water 3 to 4 hours, turning every fifteen minutes, or wash through ten to twelve waters or till water comes quite clear of all starchy appearance. Wring as dry as possible; spread in pans. Dry in a slow oven stirring occasionally. Thoroughly dried bran may be stored indefinitely.

BRAN WAFERS

3 cups dry washed bran 3/4 tablespoon India gum 1/2 teaspoon salt Hot water

1 teaspoon each of cinnamon and nutmeg and ½ grain saccharine may be added if desired.

Method.—Mix dry ingredients thoroughly; add hot water to make a soft dough. Spread in thin layers on a baking sheet greased with mineral oil. Cut in squares. Bake in a slow oven until dry and crisp. No food value.

MAPLE SYRUP—SUBSTITUTE

2 to 4 grams agar Saccharine 1 C. hot water

1/3 tsp. Mapleine extract Method.—Dissolve agar by boiling in water. Strain and add saccharine and flavouring. No food

BAKED CUSTARD

1/3 C.—80 grams milk
1/3 egg
Vanilla or nutmeg
Salt, f.g.
½ grain saccharine
or a few drops of liquor
saccharine

Method.—Beat the egg and add flavouring, salt and saccharine, and scalded milk. Pour into a custard cup. Place cup in a pan containing hot water and bake

^{*}Courtesy of the Department of Dietetics, Toronto General Hospital.

in a moderate oven. Food value: P. 4.5, F. 5, C. 4. May treble the recipe: 1 egg and 1 cup milk and make 3 custards.

AGAR JELLY

2 tablespoons agar 4 cups boiling water Saccharine Flavouring Colouring

Method.—Add boiling water to agar and boil until dissolved. Flavour and colour and pour into wet moulds. Grated rind, orange, lemon or coffee, strained cocoa shells or any diabetic flavouring may be used. No food value.

THRICE-COOKED VEGETABLE

Method.—Prepare the 5% vegetables in the usual way. Place in cold water ½ hour. Add fresh cold water and boil 5 minutes. Repeat this three times, the last time cooking until vegetables are tender. Vege-

tables may be reheated in a little broth or seasoned with meat extracts. No food value.

MAYONNAISE

1 egg
1 tb. mustard
1 tsp. paprika
1 tsp. salt
2 C. mineral oil
2 to 4 tb. vinegar

Method.—Beat egg. Add dry ingredients, continue beating, slowly adding oil. When half oil is added, add vinegar and oil alternately. Dressing should be quite stiff when finished. Food value.—P. 6, F. 6 (negligible when ordinary portions are consumed).

REFERENCE

(1) CAMPBELL, W. R., Dietetic Treatment in Diabetes Mellitus, Canadian Med. Association Journal, 1922, vol. xiii, p. 487.

RENAL GLYCOSURIA IN AN INFANT TWENTY MONTHS OF AGE*

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THE term "renal glycosuria" is applied to a condition in which sugar is excreted by the kidney without an increase in the concentration of sugar in the blood. The patient with true renal glycosuria must not subsequently develop any of the signs or symptoms of diabetes. It is a condition which requires accurate diagnosis because of the possibility of mistaking it for diabetes mellitus, and of eausing the patient unnecessary anxiety and discomfort.

Cases of renal glycosuria have, from time to time, been reported in the literature, the latest series being that of Finley and Rabinowitch, published in April of this year. In their review of the literature, the youngest case found by them was that reported by Labbé in a child of six years of age. In view of the fact that renal glycosuria may be present for years without being discovered, it is difficult to get correct figures as to the age incidence of this condition. As suggested by Finley and Rabinowitch, the greater incidence during the third decade of life is probably due to the fact that during that decade there are the greatest number of applicants for life insurance.

*Read before the second Annual Meeting of the Canadian Society for the Study of Diseases of Children, Toronto, June 14th, 1924. The case which I am about to report is interesting from several standpoints, but chiefly because the glycosuria was discovered at a time when the child had evidences of acidosis, and marked and rapid emaciation, suggesting at first glance a true diabetes mellitus.

The patient is a male child, twenty months of age. He was a very large infant at birth, weighing over ten pounds. He was breast fed for the first eight months, after which he was fed upon a great variety of table food, including tea, coffee, at times ginger ale and even beer. He showed no ill effects from this type of feeding, but rather was fine, plump, bright, and active child, with no illnesses prior to the present one. At the time of onset of his present illness, eight weeks ago, he weighed 26 pounds. His illness began with what appeared to be an ordinary upper respiratory infection. There was fever, pharyngitis, vomiting, lack of appetite. throat was red, the posterior pharyngeal wall and tonsils and soft palate were all congested; the nasal mucous membrane was swollen, and there was profuse nasal discharge: the temperature was never higher than 100.5°. The condition persisted without change for about a week, during which time almost complete refusal of food was a persistent feature. Vomiting occurred three or four times in the twentyfour hours. The bowels were somewhat constipated; there was moderate fever; the child
preferred tea, coffee, ginger ale and beer to
anything of a sustaining nature, and even these
substances when taken were promptly vomited.
At the end of two weeks there was still slight
pyrexia and the pharyngitis had not subsided.
The lack of appetite and the vomiting persisted; and by this time there had developed
a very marked degree of emaciation. The
weight at the end of two weeks was twenty
pounds,—a loss of six pounds in two weeks.

Repeated and careful physical examinations revealed nothing which could throw any light on the cause of the persistent vomiting and emaciation beyond the findings already referred to. The Von Pirquet was negative, the fundi were negative, an x-ray examination of the thorax was negative; the red blood cells were 3,900,000; white blood cells 13,600; haemoglobin 62%; polymorphonuclears 73%, lymphocytes 23%. The stool showed a moderate amount of undigested fat, no pus, no blood and no ova. Accordingly, the urine was examined, with the possibility of pyuria in view. The urine showed a specific gravity of 1020, a trace of albumen, a few granular casts, acetone and diacetic acid, and 1% of sugar. The presence of sugar and acetone in the urine, together with extreme and rapid emaciation, would naturally lead one to the conclusion that the case was one of diabetes mellitus. It was difficult, however, to reconcile the absence of thirst, the absence of polyuria and the almost complete absence of appetite with diabetes mellitus.

20 gm. of glucose dissolved in water flavoured with orange juice. The blood sugar estimated two hours after the ingestion of the glucose was 95 mg. per 100 cc. of blood. In doing the test for carbohydrate tolerance, 2 gm. of glucose per kilogram of body weight were given. On account of the age of the child and the difficulty of obtaining samples of blood, it was not possible to take sufficient samples to determine the usual tolerance curve; accordingly, a single sample was taken two hours after the ingestion of glucose, at which time the blood sugar should have returned to normal. There was no increased excretion of sugar in the urine as a result of the ingestion of the increased amount of carbohydrate.

A diet was calculated which should contain approximately 100 gm. of carbohydrate per day. With a competent nurse in charge of the child, and with the mother not allowed to see the child at all, the appetite immediately improved and he consumed the greater portion of this diet. He was kept on this diet for three days, during which time daily estimations of the urine sugar were made, while the blood sugar was examined on the first and third day of the test. The acetone disappeared from the urine immediately. The sugar excretion remained at approximately 1%, and the blood sugar was 85 mg. on the first day of the test and 98 mg. on the last day of the test.

The case was therefore considered one of renal glycosuria, on account of the unvarying excretion of a small amount of sugar independent of the amount of carbohydrate in the diet, and on account of the normal sugar tolerance. In

TABLE I. (BABY H.)

			Uri	re		Blood Suga	r Diet	Wt.
	Alb.	Acetone	Diacetic	Sugar				
Mar. 27	V.F.T.	+	+ -	+	Ferm, and	0.094	Fasting and Vomiting	
" 28		+	+	+	Glucazone	0.095	2 hr. after 20 gm. Glucose	$21\frac{1}{2}$
" 29:		0		+	Crystals	0.085		
Apr. 2		0		+		0.098	100 gm. C.H.O. since Apr. 1	214
May 13	++ cast	ts °		0		0.109	1½ hr. p.c. full diet	268
			Renal Fun	ction:	Uric Ac. 2.5: Ur	ea 16.0: Cres	at. 1.2	

The first examination of the blood was made on March 27th, at the time when the child was fasting and vomiting, and showed 1% of sugar in his urine. The blood sugar at that time was 94 mg. per 100 cc. of blood, that is a normal blood sugar in the presence of a glycosuria. On the following day, the child was given

view of the presence of albumen and casts in the urine, and in view of the demonstrated relationship between renal glycosuria and impaired kidney function, the uric acid, urea and creatinin were estimated and were found to be normal; the uric acid being 2.5, urea 16, and creatinin 1.2 mg. per 100 cc. of blood.

TABLE II. (MR. H.)

	Sugar + 100 gm. Glucos
Min. after Glucose	Blood Sugar
0	0.137
30	0.147
60	0.114
120	0.080
180	0.076

The familial character of renal glycosuria has been referred to by many writers. To determine whether hereditary influence played any part in this case, the urines of both parents were examined, and the father was found to have 1% of sugar in his urine. He was in perfect health, was on a full diet, and had none of the classical signs and symptoms of diabetes. He was given a sugar tolerance test, which was found to be normal. In his case, it was possible to take sufficient samples of blood to determine the usual sugar tolerance curve; he was given 100 gm, of glucose by mouth, samples of blood being taken at the time of the ingestion of the glucose, half an hour, one hour, two hours and three hours later. The blood sugar immediately after the ingestion of the glucose was 0.137; thirty minutes later it was 0.147; an hour later 0.114; two hours later 0.080, and three hours later 0.076. The blood sugar, therefore, rose to 0.147 mg. half an hour after the ingestion of glucose; it fell to normal within an hour and was normal three hours after the ingestion of glucose.

The chief point of interest in this case is the age at which the condition was discovered. The youngest case in literature is the one previously mentioned by Labbé, whose patient was six years of age. How long this condition has persisted, it is impossible to say; whether it was brought on by the illness and will prove to be a mere transitory phenomenon as is sometimes the case in pregnancy; or whether it was

merely a finding quite incidental to the illness, will not be evident until the child has been watched for some time.

The next point of interest is the presence of albumen and casts in the urine in the presence of glycosuria. The fact that renal function is, to some extent, impaired in renal glycosuria, and that it is associated with albumen and casts, has been pointed out especially by Klemperer and by Labbé.

The third point of interest is the familial nature of the disease, as exemplified by the presence of renal glycosuria in the father.

At present, the child has been under observation for six weeks; he has been on a full diet, he has gained six pounds. His gains have been as much as 11/4 pounds in a week; he is in excellent physical condition. The sugar in the urine was present in gradually diminishing quantities until two weeks ago; frequent samples examined since then have shown no sugar, but all have shown a faint trace of albumen and granular casts in a centrifugalized specimen. This child will be watched with a great deal of interest for as long a period as possible both for evidences of impairment of renal function, and especially for the re-appearance of sugar in the urine. The blood sugar will be observed at frequent intervals for as long a period as possible, and from time to time the sugar tolerance test will be repeated. The familial tendency in this case, as shown by the presence of sugar in the urine of the father, with a normal blood sugar and a normal sugar tolerance test, would argue in favour of a benign glycosuria, still, the fact must be impressed that we must not take the benign nature of this condition for granted, until the patient has been under observation for a period of years.

Artificial Respiration in Electric Shock and Gas Poisoning.—Cecil K. Drinker, Boston, considers the prone pressure method of resuscitation as the great reliance for immediate emergency, and the oxygen-carbon dioxid inhalation method devised by Henderson and Haggard as the physiologic antidote for carbon monoxid asphyxia, and through simple inhalation apparatus practically allowing the

patient to administer this mixture to himself. Physiologists may some day devise a positive pressure artificial respiration apparatus which, even in comparatively unskilled hands, can be relied on to ventilate the lungs. Drinker says that examination of such devices as are now on the market has failed to disclose any that prove to be of value.—Jour. Am. Med. Ass., Sept. 6, 1924.

SOME POINTS IN THE VALUE OF X-RAYS FOR PROGNOSIS IN PULMONARY TUBERCULOSIS*

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THE study of pulmonary tuberculosis in returned soldiers presents unusual opportunities which are not available at a general hospital and seldom met with even in a sanitarium. Cases at the Soldiers' Civil Re-Establishment hospitals have been followed for years with full clinical notes so that a complete study of a case over a period of several years in connection with frequent x-ray plates of the chest is possible.

Unlike the treatment of similar patients in civil life, our patients not only get free treatment, but receive what might be called a living wage for coming for consecutive treatments: whereas in civil life where the patient has to pay for his treatment and use up his capital. he goes from one doctor to another and from one sanitarium to another, if he is rich; or from one hospital to another if he is poor, so that no continuous record is available. We are thus fortunate in having gathered together in one file, full notes for four or five years, or until death has taken place. It is from this material that I have selected a series of cases showing the x-ray appearance of patients who have been studied for several years up to the time of their death.

It is an easy matter to find cases of pulmonary tuberculosis which show by the x-ray plates the extension of the disease, but I have had much search to find cases which by them show improvement under treatment. I have found cases showing extensive calcification in the upper third of each lung, which may be taken as evidence of a healed tuberculosis, but no case of active tuberculosis which later on showed this calcification as its healed end result. I have come across many cases classified as arrested tuberculosis, but in most of these cases there is no x-ray evidence that the disease has even been present. There is little doubt

that many soldiers who suffered from a more or less chronic cough have been classified as tuberculous when they really were not cases of tuberculosis. X-ray plates of these cases may show no evidence of disease past or present. In others there may be intensification of the bronchial tree passing to one or to both apices. This intensified bronchial tree I now regard as evidence of a former tuberculosis which has disappeared completely under treatment. The presence of calcified discrete spots in the upper third of one or both lungs is regarded as evidence of a healed tuberculosis which at one time must have presented under the x-rays an appearance as shown in active disease.

It is surprising how extensive the disease, as shown by x-rays, may be, and yet the patient may live for a year or longer. Both lungs may present a mottled white appearance all over, showing almost total involvement of both lungs, and yet even such a case may be alive thirteen months later. On the other hand the x-ray may show involvement of the upper half of one lung and the apex of the other lung and the patient may die of general tuberculosis after a few months.

The only x-ray skiagraph from which a definite prognosis is possible is that of a case of miliary tuberculosis where one can definitely state that a few weeks is the probable length of life. The smaller and more discrete the tubercles, the worse, in general the prognosis for an acute progress of the disease. When the tuberculous infiltration presents a pneumonic appearance the probability is that the disease will run a longer course.

The following cases are described to show the x-ray findings at various dates before death.

Case I.—The x-ray appearance of this case did not strike me as a case of advanced disease until it was examined closely and then it was seen that the lungs were studded all over with miliary tubercles. True miliary tuberculosis

^{*}Read at the Tuberculosis Conference of the D.S.C. R., Ottawa, 1924.

shows tubercles everywhere in the lungs. In other forms of tuberculosis one usually finds a part of the lungs free. This patient died of meningitis due to miliary tuberculosis nine days after this x-ray was made.

Case II.—In this case I was deceived by an appearance simulating miliary tuberculosis. The mistake arose from examining the patient by one direct view instead of by several stereoscopic views. The patient had inhaled acid fumes which had so affected the lungs that nodular swellings appeared along all the branches of the bronchioles. On a single plate it was indistinguishable from miliary tuberculosis, but when viewed stereoscopically the apparent tubercles were seen to be arranged in lines thus distinguishing it from miliary tuberculosis which is uniformly distributed. I have noticed similar nodular bronchial trees in acute bronchitis.

In contrast with this consider the next case in which the x-rays showed a little normal lung tissue at the right base, while the whole of the rest of the chest showed extensive disease, with consolidation and cavitation. From the x-ray point of view both lungs might be described as very badly affected, yet this patient lived for a year after this skiagram was made.

Case III.—In this the upper two-thirds of each lung showed active but not far advanced tuberculosis. The disease in this case became generalized and the patient developed tuberculosis of the spine, cold abscess in the hip and lumbar region and intestinal tuberculosis. Death took place two years after this skiagram was taken.

Case IV.—Suffered from tuberculosis for a period of six years. Three years before death a clinical note stated that he was a healthy looking man, and seven months before death his lesion was reported apparently arrested. The skiagram showed no arrested tuberculosis and he died 21 months after the first x-ray plate showed the disease in the right lung.

Case V.—In this case the disease had lasted six years. Three months before death the clinician, Dr. J. R. Byers, reported "tuberculosis quiescent chronic." This case did not show as extensive disease as appeared in Case IV, yet both patients died about a year later.

Case VI.—Showed more extensive disease than Case V. Pulmonary and intestinal tuberculosis caused death nine months -after the skiagram had been taken.

Case VII.—In this case the disease had lasted three years. The skiagram showed active disease; the filmy appearance of the upper two-thirds of each lung and the fine soft mottling indicated an active condition which called for a bad prognosis from x-ray appearance alone. Death took place six months later.

Before going on to cases that have improved I would like to make an observation regarding the size of the heart during the progress of pulmonary tuberculosis. I have noticed that as a case advances the heart grows small out of proportion to the general loss of weight of the body. This leads as a final result to the finding of a small heart at all autopsies in which the patient has died of tuberculosis. The deduction has followed that a small heart predisposes to the disease. It does not in my experience, for I have often found small hearts in people with no tuberculosis.

The cases that show improvement from x-ray examination may be divided into three classes. (1) Those who never had tuberculosis and were sent back from France and England with the diagnosis of tuberculosis in order to get rid of them. I think this class includes a very large number of cases classed as arrested and cured tuberculosis. Carefully made skiagrams of these show no evidence of tuberculosis and no evidence that the disease has been present beyond the small extent from which nearly everyone suffers. (2) The second class includes those with old calcified tuberculosis which is very striking in an x-ray plate, but of which I have found no previous skiagram showing the process when it was active. From this, one must conclude that perfectly calcified tuberculosis with no evidence of active disease dates back to years before the war, in fact, probably to childhood.

(3) The third class, and I am sorry to say it is a small one, shows under the x-ray, signs of active disease, and later on evidence of the process lessening and calcification coming on. In the following case x-ray pictures were taken at an interval of six months. The first x-ray plate showed active disease and no calcification. The second skiagram showed the disease less

extensive and evidence of calcification not only in the lungs but also in the costal cartilages. In connection with the question of how to induce calcification in tuberculosis it is interesting to note the effects of sunshine and cod liver oil in rickets, inducing calcification in a remarkable way so that the process can be watched with x-rays. Similarly sunshine, fresh air, and cod liver oil produce calcification in pulmonary tuberculosis, and calcification is the natural method of healing of tuberculous lesions.

I do not wish to stress unduly the importance of an x-ray diagnosis in pulmonary tuberculosis for it is seldom that x-rays do more than confirm the findings of a skilled diagnostician. At times the x-rays miss something; in other cases the clinician may miss something. The following case showed progress of the disease, where the clinical notes report improvement. The first skiagram made in 1920 showed mottling at the apices; the second made three years later shows mottling in the upper half of each lung.

From the clinical notes in this case one would infer that improvement had taken place, but the wish has been father to the clinical findings and the x-ray shows advance instead of improvement.

Conclusions

- (1) A prognosis from one x-ray examination even in an advanced case should be very guarded.
- (2) A prognosis from a series of x-ray plates is admissible.
- (3) The evidence of healed tuberculosis is calcification.
- (4) Increased bronchial tree marking may be evidence of arrested tuberculosis of small extent.
- (5) A small heart does not predispose to tuberculosis of the lungs, but advancing disease wastes the heart faster than it does the body so that the heart grows small as the disease progresses.

(Note.—The cases referred to were illustrated by numerous lantern slides.)

PNEUMOCOCCAL PERITONITIS*

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CASES of pneumococcal peritonitis fall naturally into two main groups (a) primary, so-called idiopathic, and (b) secondary, that is, following some recognized pneumococcal infection—usually pneumonia or empyema. This discussion concerns itself only with the primary form.

Our more recent knowledge of this subject is due to the work of McCartney and Fraser, of the University of Edinburgh, to whose writings the reader is referred for bibliography. Their work concerns itself with a discussion of the etiology of this disease and also with the diagnosis and treatment. It is our intention to bring before you reports of several cases of this disease that have come to our notice during the past year, and which seem to support the

work of McCartney and Fraser regarding the etiology of this condition.

It is admitted that it is possible that the peritoneal cavity can be infected and a peritonitis set up in three ways—by the blood stream, by the intestinal tract, by the way of female genitalia. As regards the haematogenous route, while the blood stream is probably invariably infected at some time during the course of pneumococcal peritonitis it is our belief that it is the result rather than the cause.

In pneumococcal infections of the respiratory tract, particularly of the lobar type there is also a blood stream infection, yet complicating peritonitis is a rarity, occurring in only about one-half per cent of cases. In their experimental work McCartney and Fraser infected the blood stream of animals with the pneumococcus. In none were they able to produce

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a peritonitis, though the animals died of septicaemia. These two facts would seem to rule out the blood stream as the mode of infection in the primary type.

For the intestinal tract to be the source of infection it must be presupposed that the pneumococcus can pass through undamaged intestinal mucosa-for repeated autopsies have failed to reveal any locus minoris resistentiae in the primary cases. We have seen recently a case of localized peritonitis ond suppurative pylephlebitis due to the pneumococcus in which the portal of entry was apparently an ulcer in the caecum. This is, the case was secondary rather than primary. McCartney and Fraser fed cultures of virulent pneumococci to animals over long periods without causing any disturbance to the animals. Finally, if the intestinal tract were the probable source of the infection, the setting free of pneumococci in the peritoneal cavity should cause peritonitis; yet the introduction by McCartney and Fraser of pneumococci into the peritoneal cavity of rabbits failed to produce peritonitis. The animals died of septicaemia before peritonitis developed, and the organisms were recovered from the peripheral blood stream eight minutes after intraperitoneal infection, showing their rapid absorption.

The genital tract would seem to be the most probable portal of infection for several reasons. Firstly, primary pneumococcal peritonitis is a disease of the female; undoubted cases of primary pneumococcal peritonitis in the male have not been recently reported. Secondly, the peritonitis is primarily pelvic, that is, the symptoms of lower abdominal pain, rectal irritation, as evidenced by diarrhoea and tenesmus, and bladder irritation, as evidenced by frequency and occasional painful micturition, all point to pelvic irritation. Thirdly, at early operation only the pelvic peritoneum is inflamed, more particularly that opposed to the fimbriated ends of the Fallopian tubes. Fourthly, cultures taken from various parts of the peritoneal cavity show more luxuriant growth of pneumococci from the lower part of the cavity; those from the diaphragm were quite scanty. Fifthly, in practically all cases, pneumococci may be recovered by direct smears from the cervix, and corresponds in type to that grown from the peritoneal surface. McCartney and

Fraser were able in some of their cases to recover pneumococci of the same type from the cervix, the peritoneum and the blood stream, while pneumococci of a different type were recovered from the throat. These facts would indicate that the genital tract is the portal of infection. In their experimental work the same observers were unable to infect the peritoneal cavity of a monkey by damaging the vaginal mucous membrane and rubbing thereon virulent cultures of pneumococci. That is, the infection was not carried to the peritoneal cavity by lymphatics from the vagina. However, they were able to infect the peritoneal cavity of a monkey by placing pneumococci in the vagina, if the vaginal secretions were first made alkaline by douching with a solution of sodium bicarbonate. That is, the protective acidity of the vaginal secretions, which become more marked in degree from infancy to adult life, must be destroyed before infection with pneumococci takes place. In vaginitis in children the secretions tend to become alkaline and a suitable habitat for pneumococci. McCartney and Fraser presuppose a vaginitis of some kind before pneumococcal peritonitis takes place. This is contrary to our experience.

The symptoms of pneumococcal peritonitis are an abrupt onset of severe abdominal pain, usually more marked in the lower abdomen; persistent vomiting and diarrhoea, with tenesmus, occasionally with bloody mucus, and frequency. Fever is usually high and continuous, prostration is very marked. In the fulminating types death may occur in twenty-four hours. Other cases run what might be called an acute course, with gradual recovery, even without operative interference. One such case we have seen, in which pneumococci were recovered from the peritoneal cavity by needle puncture. Still other cases go on to chronicity with accumulations of localized pus in the peritoneal cavity, usually in the region of the umbilieus.

The following cases, seven in number, taken from the records of the Montreal General and Children's Memorial Hospitals, present these various symptoms and types. McCartney and Fraser state that primary pneumococcal peritonitis occurs only in children, most frequently between the ages of four and seven years; one of our eases was adult of thirty-three years.

They also state that the disease occurs only among the poorer classes of society, that is, among those whose genitals are not kept clean and clothed, yet three of our cases were patients in the private wards.

Case I.—E. A. Age 4 years. Admitted to a public ward of the Montreal General Hospital, November 15th, 1923, with history of sudden onset at night with high fever, severe cramplike abdominal pain, at first generalized, later lower in abdomen. She vomited once only, but had marked nausea and loss of appetite. Admitted to hospital on second day of her illness, in a very toxic and drowsy state; temperature 104°.

Examination.—There was slight fulness of the lower abdomen, with tenderness on pressure. The rigidity of the abdominal muscles was intermittent in character. At times one could palpate the abdomen quite readily, yet ten minutes later the lower abdomen was almost board-like in rigidity.

At operation the peritoneal cavity contained no free fluid, a small amount of sticky greenish exudate being present. The surgeon noted in his report that the inflammatory process was most severe about the left tube, and gave the opinion that the peritonitis began in that area. Pneumococci was recovered from the cervix and peritoneum. The blood culture was sterile. The patient left the hospital at the end of seventy days, apparently well.

Case II.-M. D. Age 7 years. Admitted into the public ward of the Montreal General Hospital on December 2nd, 1923, with a history of sudden onset of illness, generalized abdominal pain, vomiting, and a frequent desire to go to stool. She was admitted on the third day of the disease, very toxic. There were present slight lower abdominal distension, dulness in both flanks, marked lower abdominal rigidity intermittent in character, and tenderness. The rigidity had, however, at no time the board-like hardness seen in the usual form of peritonitis. At operation there was found in the peritoneal cavity a large amount of free, yellowish-green, non-odorous pus, the source of which was not obtained. Pneumococcus, type II, was recovered from both cervix and peritoneum, while the blood culture was sterile.

The course of the disease was severe, with high temperature, and the patient very toxic. She was transfused some days after operation. She rapidly improved, but developed later a right supdiaphragmatic abscess which required drainage. She is still in hospital, with a persistent abdominal sinus, but is well otherwise. There is a concealed tuberculous infection which may bear some relation to her persistent sinus.

Case III .- E. R. Age 5 years. Admitted to a public ward of the Children's Memorial Hospital on May 31st, 1923, with a history of sudden onset during the previous night of abdominal pain, with diarrhoea and vomiting, the pain being aggravated by movement. On admission she had a temperature of 103°, the abdomen was slightly distended and quite rigid, especially over the right lower quadrant. A pre-operative diagnosis of acute appendicitis was made. At operation a small amount of free pus was found in the neighbourhood of an old kinked appendix, but pneumococci was recovered from both blood stream and peritoneum. The child died some days later, toxic with a terminal pneumonia.

Case IV.-V. W. Age 4 years. A private patient of Dr. Bazin's admitted to the Montreal General Hospital on December 24th, 1923. There was a history of sudden onset, with vomiting and lower abdominal pain and fever, followed after twelve hours by diarrhoea; no history of chill or cough. On admission to the hospital, at the end of thirty-six hours, the child was very seriously ill, there was moderate abdominal distension, more marked below the umbilieus, with tenderness only on deep pressure, dulness in both flanks, but comparatively little muscular rigidity. At operation there was found a severe pelvic peritonitis, with greenish, odorless pus. The day after operation herpes appeared on the lips. The diarrhoea, which had subsided, reappeared, and complaints of frequency and painful micturition were made. The child was transfused two days after operation. Pneumococci were recovered from the blood, the cervix, and the peritoneum, but unfortunately could not be typed.

The child was discharged at the end of thirteen days, to her home, with an abdominal sinus from which there discharged a small amount of sero-pus. During the next six weeks at home the sinus closed, and the child appeared perfectly well until she suddenly had a severe convulsion lasting six hours, for which she was readmitted to the hospital. Careful examination revealed no cause for the convulsion, and she was discharged the following week. Forty-eight hours later there was discharged from the old sinus a large quantity of greenish pus, which was apparently localized in the left hypochondrium. She has since made a complete recovery.

These four cases represent the fulminating type of the infection, sudden acute onset, marked toxicity and prostration with frequently a lethal termination.

Case V.-L. S. Age 4 years. Admitted to the public ward of the Children's Memorial Hospital on March 3rd, 1924, with a history of sudden onset of abdominal pain and moderate fever, without vomiting or diarrhoea until the third day, when both symptoms were added. On admission to the hospital, at the end of a week, there was present generalized, but not marked, rigidity and tenderness over the lower abdomen, which was tympanitic throughout. At operation there was present a few flakes of lymph of a whitish colour and a small amount of serous fluid in the lower abdominal cavity, but no generalized peritonitis. Cultures from the abdomen and cervix yielded pneumococci. The child recovered and left hospital at the end of seventeen days.

This case represents one of the mild acute types, operated on late in the disease, and which, had the diagnosis of pneumococcal peritonitis been made clinically before operation, would probably have recovered without interference.

Case VI.—H. J. Age 11 years. Private patient of Dr. Bazin's was admitted to the Montreal General Hospital on January 15th, 1924 She fell ill with cold and sore throat for two days; on the third complained of abdominal pain; fever, diarrhoea, and vomiting appeared on the fourth day. These symptoms became more severe. On admission to the hospital there was some fulness of the lower abdomen, slight muscular tenseness, but no actual rigidity, generalized abdominal tenderness more marked over the left lower quadrant. There was frequency of micturition and an examination of the genitalia showed "an early vaginitis, but no discharge." At operation there was

found greenish pus in large quantities in the peritoneal cavity, from which pneumococci were recovered. This organism was also recovered from the cervix. Drainage of a localized abscess was required later. The child left the hospital well at the end of forty-three days.

This was also one of the mild type of cases. Case VII.-Mrs. R. Age 33 years. A private patient of Dr. Ebert's was admitted to the Montreal General Hospital on December 25th, 1923. Her illness began with diarrhoea and vomiting, fever to 103°, epigastric pain and labial herpes. She was treated for gastroenteritis, and at the end of nine days had a normal temperature, following a "crisis," and felt well. After the twelfth day she began to suffer from an irregular fever, and a localized abdominal swelling was noted to the right, and in the neighbourhood of, the umbilicus. Operation on the twenty-fourth day of the illness released a large quantity of non-odorous, greenish-yellow pus from two cavities, one near McBurney's point and one about the right ovary. This pus yielded pneumococci. The patient recovered and left hospital on the thirty-second day.

This case exemplifies the mild acute type, going on to chronic localized peritonitis.

Operative findings.—In early cases there is first a film of exudate over the pelvic viscera, oily and sticky in character. After twenty-four hours this exudate becomes more watery in character, of a greenish colour and contains flakes of lymph. Free pus is present, usually in large quantities, after the fourth day. Purulent material is found in the Fallopian tubes from which pneumococci can be removed by culture.

Treatment.—McCartney and Fraser conclude from their cases that early operation, with drainage if free fluid be present, holds out the greatest hope of recovery. Our experience would support this. However, in one case, in which there was no free fluid, but only a greenish sticky exudate, the abdomen was closed without drainage, and was followed by recovery. McCartney and Fraser also recommend blood transfusion, with large quantities given, if possible, during the septicaemia. Careful nursing, liquid diet, fresh air, and abundant fluid would seem to be our best means of combating this condition. If fluids by

mouth are not well retained, subcutaneous saline injections or glucose saline solutions intravenously are indicated. I have been able to find no information on the use of specific sera in pneumococcal peritonitis.

My friend, Dr. L. J. Rhea, the pathologist, tells me that the organisms are usually type IV, for which there is no serum to date.

In conclusion there is one point in diagnosis that I would emphasize. There are present signs of toxaemia or septicaemia, and peritonitis, but examination of the abdomen does not reveal the same degree of rigidity or tenderness usually seen in a child as acutely ill from ordinary peritonitis. Rigidity is present, but is not board-like in character and is more generalized. Although abdominal pain, tenderness and resistance are usually present, in our experience they are not constant, but tend to be rather intermittent in character, present at one examination, but much diminished an hour or so later.

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VITAMIN "A" AND ITS VARIATIONS IN COD LIVER OIL

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VITAMIN A is the name that has been used for several years to describe the accessory food factor which is soluble in fat, and whose deficiency in the diet of animals leads to the production of many pathological conditions. It has been known since 1913 that the absence of this factor leads to the lack of growth in young animals and also leads in these animals to a pathological condition of the conjunctiva which with its superimposed infection is known as xerophthalmia. This lack also may lead to the production of rickets in young growing animals and this is certainly true also of infants.

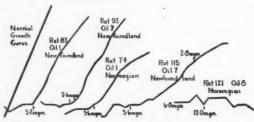
The richest sources of vitamin A in ordinary foods are, whole milk, cream, butter, eggs and leaf vegetables. A good sample of cod liver oil contains about two hundred times as much vitamin A as average butter. It is, therefore, a useful addition to the diet of children whose foods are low in the above constituents, and promotes their growth and general well-being. It is also of special value in children who, owing to its deficiency are showing symptoms of rickets. Here it acts as a specific.

Since the experiments were begun in this laboratory, A. V. McCollum and his coworkers² have published the results of experiments which seemed to show that the growth-

promoting factor in cod liver oil was not identical with the antirachitic factor. Their conclusions have been corroborated by more recent work by Goldblatt and Zilva3 who have found that the growth-promoting and the antirachitic properties of cod liver oil are inactivated at different rates by heat and aeration; they likewise found a great disparity between the growth-promoting and the intirachitic potency of spinach. From these experiments it is quite clear that in cod liver oil there are two important factors, one of which has to do with the promotion of growth in young animals and their general well-being, and another which is a specific against the development of rickets. There is no evidence that in cod liver oils there may be an absence or very great lack of one of these vitamins which does not exist for the other. In other words, at the present moment an estimate of the growth-promoting factor is likely to indicate the antirachitic value also. While this appears to be true of cod liver oil it is not generally true in regard to the distribution of these two factors in nature, spinach, for instance, contains a high growthpromoting but very low, if any, antirachitic value. Similar facts may be adduced in regard to certain of the millet seeds.

It has been shown that the antirachitic vita-

min may be stored by young animals and probably also by adults, but that this storage in young animals is relatively of a temporary nature. Chick,⁴ Goldblatt,⁵ Hume,⁶ McCollum⁷ and other workers have shown that sunlight or irradiation of animals by the mercury vapour quartz lamp enables an animal to be economical in its use of both the antirachitic and the growth-promoting vitamin.



Typical growth curves showing the variation in strengths of different cod liver oils.

The experiments subsequently described. were begun in the summer of 1922 and were due to the fact that Zilva and Miura1 had reported that presumably good cod liver oil gave definite growth in doses which varied from sample to sample. The variations were as great as 300% and several commercial firms were already marketing cod liver oils whose vitamin content were supposedly checked physiologically and were guaranteed to be of high vitamin content. It seemed, therefore, of importance to ascertain whether commercial samples of cod liver oils show such great variations and also to ascertain whether the general opinion that Norwegian oils were more useful and valuable than those manufactured in Newfoundland were true. Since these experiments were begun, also, careful surveys of the cod liver oil industries in both Norway8 and Newfoundland9 have been carried out by Drummond and Zilva and our experimental facts but go to sustain those obtained by these observers. Zilva and Drummond¹⁰ have found a sixteenfold variation in the potency of the cod liver oils which they have examined. They found that invariably the Newfoundland oils were more uniform and of higher potency than those from Norway. This may be due to the fact that in Newfoundland the industry is under government control and the process is more uniform than those employed in Norway, but it may well be that it depends in part on

the character of the foods on which the cod lives. During certain parts of the year the cod feeds largely on caplin, a smaller fish, while at other seasons their food is mainly squid. The oil from cod living on either of these diets seemed to be of equal potency.

The estimation of the vitamin A content in cod liver oil was carried out in the following manner. Young rats, which must be of standard breed and weighing 30-50 grams, were put upon a diet free from vitamin A. This requires a great deal of care in its preparation as many of the foodstuffs contain appreciable quantities of vitamin A. As a source of protein casein was used. It must be freed from the vitamin A which it contains. Lard was used as the source of fat and it may contain small amounts of vitamin which must be removed. The same is true of starch which formed the source of carbohydrate. The animals must also be supplied with vitamin B, otherwise growth will not occur and for this purpose specially prepared dried brewer's yeast was employed. The salts necessary for the body were carefully weighed out and mixed in due proportions. The salt mixture used contained in all ten different salts. Five per cent of agar agar was added to the diet to prevent diarrhoea. The mixture finally employed was similar to that used by Drummond and Zilva and contained casein 18%, starch 53%, lard 15%, salt mixture 4%, agar agar 5%, and yeast 5%. On this diet young rats ceased growing after ten or twelve days. The cod liver oil was then fed to each rat separately in the form of a drop from a hypodermic syringe. If the cod liver oil were very potent so that less than one minute drop was needed each day, the oil was diluted with olive oil from which the vitamin A had been removed. The rats were weighed every two or three days and their weights charted. Some samples of typical growth curves obtained in this way are shown.

From these experiments it was shown that cod liver oils from Newfoundland were high in vitamin content while other oils of Norwegian source were very low, indeed an oil from one of the largest distributors of Norwegian oils, who is most careful in the quality supplied, was of very low value. Whereas animals on Newfoundland oils grew well on as little as 2.8 milligrams of oil a day, rats on 12 milligrams

of this Norwegian oil failed to grow, and died. This shows a variation of at least 400%, and taken in conjunction with the work of Zilva and Drummond shows that Newfoundland oils are to be preferred.

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The Diabetic Problem of To-day.—The Jew, in the opinion of Elliott P. Joslin, Boston, is not prone to diabetes because he is a Jew, but rather because he is fat. A study of the weights of the adult diabetic Jewish patients before they contracted the disease shows that the tendency is distinct for them to be fatter than the average diabetic patient under similar conditions. Eighty-five per cent. of the Jewish patients were overweight, in contrast to 70 per cent. of a mixed series of 1,000 Gentiles; 4.7 per cent. of them were underweight, in contrast to 12.2 per cent. of the non-Jewish patients. If diabetes were a characteristic of the Jewish race, it should be manifested from youth to old age, but this is not the case. On comparison of the age incidence of the disease in 500 of Joslin's Jewish patients with the age incidence of the disease in 2,611 of all his patients, it was found that, instead of the incidence running parallel through all the decades, it was but half as common among Jews in the first two decades of life, and less common in the third, sixth, seventh and eighth decades, leaving the fourth and fifth decades alone to exceed the Gentiles in age frequency. A Jewish child is no more prone to diabetes than the child of a Gentile. One hundred and twentyseven of Joslin's patients, selected chiefly for the unusual severity of the disease, have taken insulin on the average for about eighteen months, and all for more than one year. Twenty-three of the patients are dead, and 104 are alive. The duration of the diabetes in the fatal cases was 5.4 years, and in the living patients has already reached 5.3 years. Although one of the living patients has had the disease 24.3 years, not one of the patients who died succumbed during the first year of the

disease. There were nine deaths from coma, but only two of these occurred in the hospital. Seven of these coma deaths were needlessthey were the result of ignorance and inexperience or deliberate neglect of treatment, even to the extent of giving up insulin. Of the remaining fourteen deaths, septicemia, meningitis, erysipelas, tuberculosis, multiple abscesses, and intestinal obstruction in a woman over eighty years of age, each accounted for one, while cardiorenal disease and pneumonia each accounted for four deaths. Ninety-three of the 127 patients are still taking insulin, and the average dose is 21.4 units. Ten patients are alive and not using insulin.-Jour. Am. Med. Ass., Sept. 6, 1924.

Certain Problems in the Treatment of Diseases of the Thyroid Gland .- Since George W. Crile, Cleveland, has carried out a definite plan of management for the prevention of goitre, there have been no deaths from so-called hyperthyroidism; the occasional death-approximately one in 100-is due to some complication, e.g., heart failure, cerebral haemorrhage or pneumonia. Goitre is among the most preventable of diseases; its treatment, in whatever form it presents itself, is accurately defined. Prevention is achieved by the administration of iodine throughout adolescence and pregnancy. Simple goitres should be excised if they cause pressure or are adenomatous. Malignant goitres should be excised if possible; or they should be decompressed, followed by radiation. For hypofunction, the essential product that is lacking should be added. For hyperfunction, the essential product that is overabundant should be diminished .- Jour. Am. Med. Ass., Sept. 13, 1924.

Case Reports

MEDULLARY HYPERNEPHROMA WITH CRANIAL METASTASES

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Malignant medullary tumours of the suprarenal gland, first brought to the attention of clinicians and pathologists by Robert Hutchinson in 1917, have since that time received considerable attention, and over 50 cases have been reported in medical literature.

The condition is usually divided into the two types of Pepper, and Hutchinson. The Pepper type is the less common of the two and is characterized by a primary tumour of the suprarenal with liver metastases, but with no secondary growths in the skull or bony skeleton. The Hutchinson type runs a longer clinical course, and is characterized by malaise, loss of weight, pallor, ecchymosis about the eyes, and metastases in the skull, sternum, ribs, or long bones.

The following case is an example of the Hutchinson type, and is interesting because of the extensive skull involvement, the lack of orbital ecchymosis and the absence of a palpable abdominal tumour.

Case report.—Norman K, age 5 years, male white Canadian, admitted to the University of Alberta Hospital, Dec. 12, 1923. The chief complaints were general pains about the body, and weakness, of six months' duration, with gradually increasing pallor for four months. Father, aged 33, suffering from diabetes mellitus. Mother, also 33 years of age, healthy. Three other boys and one girl in the family, all healthy. The patient, the youngest child, was born at full term, had normal delivery, and was nursed for five months. Teething, talking, and walking began at normal times; no history of any illness previous to the present condition.

About six months before admission, the

mother began to notice that the child was not enjoying his usual good health. He did not want to play as usual, and spent most of the time just sitting in the house. Soon he began to complain of indefinite pains about the body and (as frequently occurs at this stage of the disease) the diagnosis of a rheumatic condition was made. He was kept in bed and treated for six weeks, but the pains gradually became worse, troubling him especially at night. These pains were of sufficient severity to cause him to cry out, and were mostly in the legs. His usual ruddy color disappeared and pallor became more and more noticeable. This clinical picture continued until two days before admission, when it was noticed that his left eye seemed to be more prominent than the right. His doctor sent him to the city for observation and diagnosis.

The physical examination showed a well developed, but pale and poorly nourished child. He did not appear to be suffering from acute pain, but took very little notice of his surroundings. He replied readily to questions. The left eye showed a slight but definite proptosis. There was no discoloration to be seen in the region of the eye. Conjunctivae were clear. Teeth were in excellent condition. Heart and lungs were negative. The abdomen was soft and easily palpated. Liver edge just palpable. Spleem not palpable. No tumour masses felt. No tenderness elicited.

Urine.—Acid, 1020, slight trace of albumin, glucose negative. Microsopically a few red blood cells were seen.

Blood.—Haemoglobin, 40%, red blood cells, 3,470,000. White blood cells, 10,800. Polymorphonuclears, 42%. Lymphocytes, 50%. Transitionals, 6%. Eosinophiles, 2%.

The eyes were examined by Dr. R. B. Wells who reported that the fundi were normal, and the left eye showed definite proptosis and slight restriction of movement. A radiograph of the skull indicated new bone formation taking place in the wall of the left orbit.

During his four days' stay in the hospital he was drowsy, and slept considerably. He cried out occasionally and complained of pain in the head and left arm. The temperature varied from 98°-101.5°. Pulse, 110-130. Respirations, 26-30. The amount of urine averaged 30 fluid ounces in twenty-four hours; there was no polyuria. The bowels were slightly constipated.



Fig. 1.—Skull cap showing external surface with numerous haemorrhagic nodules.

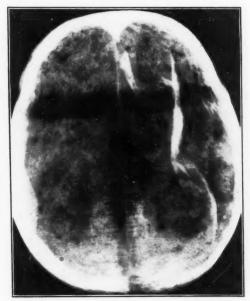


Fig. 2.—X-ray of vault of skull (Postmortem) showing marked separation of suture lines by extensive tumour processes.

In the differential diagnosis, the blood picture ruled out chloroma and other leukaemic conditions. There was no evidence of scurvy. A primary sarcoma of the bony orbit is rare, but cranial metastases from a medullary hypernephroma with proptosis, not uncommon.

Clinical diagnosis.—Medullary hypernephroma with cranial metastasis. Permission for an autopsy was obtained, and the child was taken



Fig. 3.—Kidney and attached suprarenal, (Other kidney and suprarenal show identical picture).



Fig. 4.—Pancreas, showing sanguinous tumour nodule.

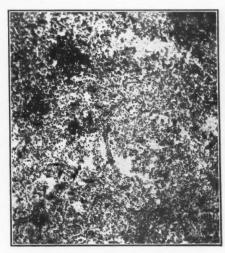
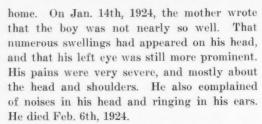


Fig. 5.—Suprarenal tumour. Low power.



Fig. 6.—Suprarenal tumour. High power.



Autopsy findings.—The body was that of a markedly emaciated young male child, older in appearance than stated age. The head of the child was strikingly large and presented a multiple nodular formation involving practically the whole vault of the skull from the occiput to the orbit. The left eye showed pronounced proptosis; also the right eye to a lesser extent. There were no skin blemishes or ecchymoses, or any external evidence of tumour. other than those involving the skull. Examination of the thoracic contents showed no marked abnormality. No adhesions, and there was no evidence of tumour involvement; thymus not enlarged; heart and lungs negative. The abdomen showed no abnormality other than tumours involving both suprarenals, and the pancreas. The liver not enlarged, was soft and pale. The gallbladder was negative.

Just above each kidney, in the position normally occupied by the suprarenal, was a haemorrhagic nodular mass slightly larger than the normal suprarenal. These masses, which were bilaterally identical, measured $2\frac{1}{2} \times 2$

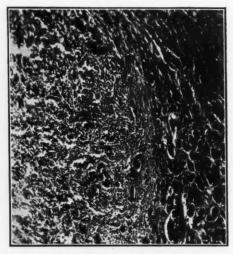


Fig. 7.—Tumour of pancreas. Low power.

cm. and were attached to the upper pole of the kidney by loose fatty tissue. They were irregularly nodular in outline and of a deep haemorrhagic hue. Distributed over the surface of the pancreas were three small tumour nodules of a similarly haemorrhagic nature, varying from 11/2-1/2 cm. Kidney, spleen, genito-urinary and gastro-intestinal tracts showed no abnormality. Mesenteric lymph nodes were slightly enlarged and soft, but showed no evidence of tumour involvement. Portal lymph nodes were negative. The entire vault of the skull from the occiput to the orbital region was involved in numerous haemorrhagic, soft, non-encapsulated tumour masses. The majority of these tumours were situated on the external surface of the skull, beneath the epicranial aponeurosis. Arising from the bony vault, they invaded the periosteum and formed large protuberant masses, which could be felt through the scalp as semifluctuating swellings. There were also many extradural nodules on the inner surface of the skull, with marked erosion of bone of vault, and formation of osteophytic spicules. The tumour did not invade the dura, the undersurface of which was smooth and unattached to brain cortex, except in the area of the falx, where there was attachment and tumour involvement. The brain showed no marked obnormality other than depressions caused by tumour nodules.

Histological findings.-Microscopically, sec-

tions made from different portions of the tumour nodules all show a similar structure, i.e., that of a round celled sarcoma. There is little that suggests a neuroepithelial origin. The occasional multipolar giant cell might possibly suggest a form of ganglion cell. There is no evidence of chromaffin system contents. In the suprarenal tumour, there is some slight resemblance to cortical suprarenal tissue at the periphery of the haemorrhagic tumour mass, but other than this, there is no evidence of normal suprarenal tissue. The greater portion of the tumour is composed of cells of the small round type, in a loose connective tissue stroma. Peculiar about the tumour is the presence of numerous small vessels with thin capillary walls. This marked vascularity, together with many areas of haemorrhage, give to the tumours their bright red sanguinous appearance.

Sections from the pancreatic tumours show a similar picture of extensive cellular infiltration. The head of the pancreas, which appears to be involved in a large firm, whitish tumour process, resembling grossly normal pancreatic tissue, on section shows a similar cellular infiltrative process, but without the vascular and haemorrhagic features seen in the other tumour nodules.

Sections of tumours of the skull show to even a more marked extent than in the suprarenal and pancreatic nodules, the vascularity and haemorrhagic features mentioned.

Summary

A typical case of hypernephroma of the Hutchinson type, the interesting features of which are:—

- 1. The enormous extent of the cranial metastases.
 - 2. The small size of the primary tumour.
- 3. The bilateral involvement and similarity of the suprarenal tumours.
- 4. The absence of ecchymoses about the orbit, which is usually one of the first clinical signs of cranial involvement in these cases. The medulla of the suprarenal gland being neuroectodermal in origin, these tumours have been more recently designated as neuroblastoma, which derivation was first mentioned as a possibility by Virchow.

VARICOSE ANEURYSM—RIGHT AXIL-LARY VESSELS

Reported by Dr. H. S. Dolan, House Surgeon From the Surgical Department, Royal Victoria Hospital, Montreal.

This example of one of the varieties of arterio-venous aneurysm is presented on account of its various interesting points. Dr. M. S. Lloyd, as an undergraduate, was of great help in the compilation of data.

A male Italian, Case No. 51680, aged thirty-two, was admitted at 8.00 a.m., January 13th, 1924, having been stabbed during a street brawl, and left lying in the snow, in the early hours of the morning. He was cold, and exhibited the symptoms of "shock haemorrhage," in a fairly well marked degree. P. 124 Temp. 96°, Resp. 26. R.B.C. 2,920,000; Hgb. 62%.

Examination disclosed a conical swelling about the size of a walnut below the right clavicle, 11 cm. from the sternal end. At the apex of the cone was a slit-like opening 1 cm. in length, from which protruded blood-clot. Two hours later, distinct expansile pulsation in the conical swelling was found, synchronizing with the apex beat. A continuous purring thrill, increasing sensibly during systole, could be felt on the right side of the neck on slightest digital pressure, just above and midway between scapula and clavicle. This feathery thrill could also be felt just below and to the medial side of the wound.

On auscultation, a loud continuous rumbling bruit, intensified during systole, was heard over the whole front and back of the chest, louder on the right side, conducted as far as the right wrist, and along the right carotid vessels. Superficial veins were only slightly distended. The apex beat of the heart was visible and palpable as a diffuse impulse, in the fifth interspace just outside the nipple. The pulse was not palpable in the right ulnar or radial arteries, nor could it be heard at the elbow with a stethoscope. In the left arm, pulse palpable, somewhat "water hammer" in character. No capillary pulsation demonstrated. Sensation was dull in the right arm, but this was probably incidental to his condition, for, although the knife, (narrow stiletto), had severed the brachial vessels, examination by the neurologist could discover no definite nerve lesion at any time during his illness.

On January 14th, thirty-two hours after injury, the pulse was just palpable in the right radial artery, very feeble in force and delayed in time, in comparison with the left radial pulse. The left pulse was now definitely "water hammer" in type. There was not sufficient blood pressure in the right forearm to register on a sphygmomanometer. Percussion of the chest gave a relative cardiac dullness, $2\frac{1}{2}$ cm. to right and $11\frac{1}{2}$ cm. to left of the sternum, i.e. heart was definitely enlarged. X-rays showed the extreme breadth of the heart to be 16 cm.

When the right subclavian artery was obliterated by digital compression against the first rib, it was noted that the rapidity of the heart decreased ten beats per minute, also that the bruit, thrill and right radial pulse stopped, while the conical swelling subsided somewhat. There are many explanations offered for this slowing of the heart beat during compression but perhaps the simplest and most satisfactory is the following.

Granted that the nervous mechanism of the heart is intact, the filling of its cavities is a stimulus to contraction. In an arterio-venous aneurysm, blood enters the vein more or less directly from the artery, and returns to the heart with the visatergo of arterial pressure. The right side of the heart is therefore filled more rapidly, and consequently beats more quickly. The proximity of the lesion to the heart, in this case, makes this explanation more plausible. Along with the slowing of the heart beat, the systolic blood pressure on the unaffected side was raised from 120 to 126 mm. Hg. The heart wall had evidently been labouring under too heavy a load, and had suffered somewhat from the distension to which it was subjected. The presence of this unusual and persistent extra load may compel early operation in a patient whose heart is not compensating well.

The patient could always execute any desired movements. His general condition steadily improved. The blood pressure in the right arm rose to 80 mm. Hg. while that in the left arm was 120. The swelling below the clavicle increased in size. The expansile pulsation slowly became more marked. The clot from the

wound protruded so much that rupture seemed imminent. For these reasons operation was decided upon.

On January 18th, 1924, the patient was operated on by Sir Henry Gray, Chief Surgeon. The subclavian artery was compressed digitally. Horizontal incision, which divided part of the pectoralis major, revealed a condition simulating varicose aneurysm. There was a wellformed sac, 11/2 inches in diameter. The artery was found completely cut across; the vein practically so, the severed ends being held together by the merest shred. The ends of the artery had separated about two inches. The proximal end was found with difficulty among the upper cords of the brachial plexus. Besides returning through the patent proximal end of the vein, the blood must have flowed through the canalized clot, which formed the wall of the aneurysm, to the distal end of the artery, which was quite patent, and of practically its normal size. When the clot, which completely blocked the distal end of the vein was scooped away (both ends of the artery having been temporarily clamped), and digital compression of the sub-clavian removed, blood escaped freely, showing that the collateral circulation was established. This being so, quadruple ligature was employed, i.e. both ends of the artery and of the vein were tied separately with strong linen. At the end of the operation, 500 cc. of citrated blood was given.

Immediately following the operation, the pulse was not palpable at the right wrist, but evidence of circulation in the fingers was quite definite, as shown by the rapid return of pink colour to the fingers after local pressure had been made.

On January 20th (forty-five hours after operation), the pulse was countable in the radial artery, and on January 21st, the blood pressure in the right arm had returned to its preoperative level, 80 mm. Hg. Examination of the heart twenty-four hours after operation, showed the relative cardiac dullness to be 1 cm. to the right, and 9 cm. to the left of the sternum, a reduction of 4 cm.; apex beat in the fifth interspace, 1 cm. inside the nipple line. The left pulse had lost much of its "water hammer" character, the bruit over the chest had disappeared. There was a slight systolic murmur at the base of the heart, which entirely

disappeared in three days. X-ray of the chest showed the extreme breadth of the heart to be 13 cm.

This change of condition suggests that the heart had suffered an acute mechanical dilatation, with relative insufficiency of its valves. The post-operative systolic murmur was the last demonstrable evidence of cardiac abnormality.

On January 24th, the right arm became painful and swollen, on its inner side, along the path of the main veins, for a distance of 4 inches below the axillary fold. Definite thrombosed veins could be palpated in this area. On January 27th, pulsation was made out in the right transverse cervical artery. On February 1st, it was noted that the blood pressure and pulse was failing in the right arm, (systolic 50 mm. Hg.). On February 5th, radial pulse could not be palpated. This continued until March 4th, when a slight ulnar pulse was discerned, and in a few days thereafter the radial could be counted. In the interval, however, the muscles were strong, and the superficial veins ascending the arm were distended with blood. The hands, on transillumination, revealed good oxygenization, being of a cherry red colour. Circulatory condition showed very little, if any, external change. On February 20th, when the patient was discharged, the blood pressure in the right arm was 15 mm. Hg. At this time, he was able to use his right arm with ease, there being practically no wasting of the muscles.

He returned for observation on March 20th, and again on May 20th, when the blood pressure in the right arm registered 22 and 36 mm. Hg. respectively. The pulse was still weak, and of low tension, but easily palpated. On last being seen, the patient had returned to his usual occupation as a labourer, and except for his right arm becoming tired more easily than previously, he was quite normal.

A further point of interest in this case is that in spite of the thrombosis in the distal vessels after operation, evidenced by the disappearance of the radial pulse, and the swelling along the course of the veins, the nutrition and strength of the arm was excellently maintained.

The case also demonstrates the recuperative power of nature in supplying a second collateral circulation, when the first became occluded by thrombosis. This was shown by the return of the pulse and blood pressure to the right arm following its disappearance after operation.

The persistence of the patency of the distal part of the severed artery is remarkable and inexplicable, in view of the contractile elements in the arterial wall. It was indisputable that the blood was flowing through this part of the vessel because, (1) ligature obliterated the comparatively strong radial pulse, and (2) there was a blood pressure of 80 mm. Hg. present at the time of operation, which disappeared immediately thereafter.

REPORT OF A CASE OF CUTANEOUS MYIASIS IN AN INFANT. WOHLFAHRTIA VIGIL (WALKER) INFECTION

GORDON CHOWN, B.A., M.D.

Clinical Demonstrator in Paediatrics, Faculty of Medicine, University of Manitoba Attending Paediatrist, The Children's Hospital, Winnipeg.

Baby R .- Age three months.

Family History.—First pregnancy. Father and mother living and well. No history of tuberculosis, asthma, eczema, or venereal disease.

Personal History.—Born at full term, and in normal labour in Camper, Manitoba. Birth weight 5½ pounds.

Past History.—On May 31, 1924, I had occasion to see the baby for the first time, the complaint being restlessness, with colic and vomiting after nursing.

Physical examination.—Age two months. Weight ten pounds, eight ounces; general condition was excellent and the examination yielded only negative results. She responded promptly to regulation of the breast feedings.

Present Illness.—The mother stated that in the evening of June 27, 1924, she noticed a red area, resembling a small boil on the external part of the pinna of left ear. In the morning there were several similar areas, mainly in the fold of the neck on the right side. June 28th, the infant was seen by me at 3.30 p.m. Age three months. Weight eleven pounds, nine ounces. She was a well nourished, nursing baby. Examination was entirely negative, with the exception of the skin. In all there were twelve areas which closely resembled small furuncles, one on left ear, nine in the fold of the neck right side, one at the junction of upper and middle third of the sternum, and one in the right popliteal space.

A tentative diagnosis of furunculosis was made, although doubtful on account of the excellent nutrition of the baby, and the fact that she was nursing and thriving well. On the mother's return home, she telephoned that she could see something moving in the centre of one of these small boils. She was instructed to press it out and send it to the office, where examination revealed a larva, alive, very active, measuring about 4 millimeters in length. In all 14 larvae were removed, three of which were expressed from one area.

Owing to the rapidity with which the mother removed and destroyed the larvae I was unable to obtain any of them for further study. The infant made an uneventful recovery, the lesions being entirely healed in three days leaving no sears.

The baby had lived in Winnipeg for four weeks, in a nice residential district opposite a small park, but I noted at the time of my visit on the following morning, that the screening of the house had become defective and as a result of this there were a great many flies within the yerandah.

From a study of the cases reported by Walker¹ ² and the marked resemblance of my case to the photograph and the corresponding description of the case reported by Brady³, I feel that the diagnosis is justified.

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FOREIGN BODIES IN THE BRONCHI A REPORT OF TWO CASES

J. GRANT STRACHAN

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The following cases, while not presenting any particular difficulty in their treatment, were deemed of sufficient interest for recording.

Case I.—D. W., male, age 4 years. Admitted, September 9th.

History.—On September 5th while eating fish the child had an alarming fit of choking. After recovery he was apparently comfortable except for some slight dyspnoea. On September 8th child became feverish. Because of this and the continued dyspnoea admission to hospital was advised.

Physical examination.—Well nourished boy of 4 years; somewhat irritable and restless; dyspnoea of moderate degree. Chest.—Expansion appeared to be less on the right side. Lungs.—Breath sounds on right side very distant; on left side, harsh over upper lobe. A few scattered moist râles throughout the left.

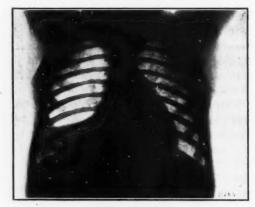


PLATE No. I.

Radiologist's report:—(See plate I).—21264—Sept. 9th,—On fluoroscopic examination, the case showed the typical signs of a foreign body in bronchus; apparently in R. hyparterial bronchus: the R. diaphragm will not move except in shallow jerking fashion; a broad area across R. base shows density about equal to that of a pneumonia, and all of the lung above it is brilliantly illuminated, as from emphysema. Radiograph gives same appearance. In addition, a small rounded, opaque shadow is seen at left border of 6th dorsal vertebra.

September 10th.—Direct bronchoscopy and removal of a knuckle of fish bone the size of a

pea from the entrance to the right bronchi; ethyl chloride and ether anaesthesia. (See plate II.)



PLATE No. II.

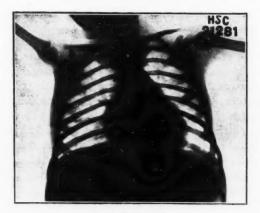


PLATE No. III.

September 11th,—Radiologist's report:—(See plate III).—21281—Base of right lung has cleared to a remarkable extent. Foreign body no longer shown. Emphysema of upper right chest has disappeared.

Chest.—Lungs, clear with the exception of a few scattered moist râles. General condition satisfactory, discharged.

Case II.—N. 1, male, age two years. Admitted February 4th.

History.—Child was in good health until four weeks ago when he had a fit of choking while eating nuts. Since then, although in good general condition, he has had a cough and wheezing respiration. The cough is absent when quiet. Occasionally some yellow sputum was coughed up.

Physical examination.—Well nourished boy of two years in good condition. Has cough and wheezing respiration when moved. Chest.—Expansion equal and unimpaired. Lungs.—No dullness, no bronchial breathing. Dry high pitched rhonchi scattered throughout on both sides.

Radiologist's report:—29843—February 4th, 1924.— No evidence of any foreign body shown in chest. Diaphragm moves freely on both sides although respiratory movements are rather shallow. There are no heavily clouded areas of lung, suggesting marked congestion, but diffuse mottled shadows are shown rather widely distributed, particularly in upper left chest. Little or no definite studding is shown.

February 14th.—Bronchoscopic examination under ethyl chloride and ether anaesthesia; The mucosa of the larynx and trachea was somewhat injected. The right bronchus was apparently blocked with granulations from the centre of which a yellowish white object protruded.

February 25th, 1924.—Bronchoscopic examination under ethyl chloride and ether anaesthesia. A portion of nut kernel (see plate IV.) was removed from the right bronchus. The nut showed very little sign of decomposition and was quite firm. After loosening it from the bronchus with a long hook it was easily removed by Tilley Jackson's forceps.



PLATE No. IV.

March 7th.—Bronchoscopic examination under examination under ethyl chloride and ether anaesthesia. Appearance of trachea and bronchi normal. Tonsils and adenoids removed. March 14th.—Discharged in good condition.

Summary.—The clinical and radiological findings exemplifying complete occlusion of one main bronchus are well shown in Case I. Without the history of possible inspiration of some foreign matter Case II would be very difficult to differentiate from asthma or chronic bronchitis. It is in this type of case that a bronchoscopic examination is so valuable. The remarkable tolerance of the bronchi to foreign matter is also well shown. In the second case an organic foreign body had been in the bronchus for over six weeks without causing any grave symptoms or lowering the general condition of the patient very much. My thanks are due to Dr. A. H. Rolph, Radiologist, Hospital for Sick Children.

A CASE OF EARLY DEMENTIA PRAECOX

BARUCH SILVERMAN, M.D.

Psychiatrist, Mental Hygiene Committee Montreal.

In the early part of March, 1923, there was referred to our Child Guidance Clinic a boy eleven years of age with the complaints of nervousness and incorrigibility. He was sent from a public school with a report which said that he was quarrelsome, disagreeable, had difficulty in understanding things, and was very slow to answer; he always appeared to be paying attention, but when spoken to did not seem to hear anything, and would frequently give the impression that he was waking up out of a dream. During the six months prior to March, 1923, the boy had begun to fail rather conspicuously in tasks which till then he could carry out quite easily; he became more and more outstripped by his companions; he was absent-minded, thoughtless, began to make incomprehensible mistakes, and could no longer follow the teacher's instructions, and did not reach the standard of the class.

The father who brought the boy to the clinic was able to give a fairly complete family history. A paternal aunt had been confined for several years in a hospital for the insane, as the result of a severe nervous breakdown, the details of which the father was unable to give. No other evidence of nervous or mental disease was discovered in the family. Both parents and the two younger children were quite normal and had presented no signs of instability or maladjustment.

Our patient, the eldest of three children, was born in Russia, and had lived there until he was nine years old. During the past two years he has been living with his parents in Montreal. Birth, delivery, and early development had been quite normal. He suffered from no unusual illnesses during infancy and childhood; and was quite robust and developed rapidly, and no history was obtainable of convulsions, night-terrors, enuresis or other nervous symptoms. His disposition, however, as a child was described as cranky, peevish and fretful. The development of his intellectual faculties was at first rather precocious; he learnt to read and

write at a very early age and made rapid progress in his schooling. He became rapidly acquainted with things of general import and so much did he excel in this that at an early age (eight) he knew more about the politics of the country than his parents did, and was able to discuss intelligently problems of a rather serious nature. He took readily to his school work on his arrival in this country and was able to get along quite well for one year when a gradual change began to manifest itself in him. He became backward, sluggish, lazy, reticent and shy with strangers, and gradually developed a marked antagonism toward the father. During the past few months, he seemed to have lost all the desire for approbation that he had manifested previously. The father said that at times he noticed the boy staring peculiarly and laughing in a very foolish and unusual manner. More recently the patient had become careless of his personal appearance and expressed odd ideas.

Physical examination did not reveal anything of an abnormal nature. He was quite well nourished and developed, presented no evidence of any disease of the heart, lungs or abdomen; the mouth and teeth were in good condition, his tonsils were enlarged and somewhat congested; the cranial nerves were intact. No pathological reflexes were noted nor did there appear to be any abnormality in sensation. Attitude, gait, posture, and tone were normal.

The psychiatric examination revealed a number of interesting facts. Objectively the boy seemed to be abstricted, indifferent, and disinterested in what was going on about him. He co-operated very poorly for examination purposes and had to be urged and prodded to respond to questions. No mannerisms were noted in his speech, but his facial expression was essentially one of absorption, with at times a peculiar staring into vacant space. Although his field of motor activity was normal (that is, he was neither overactive, nor were there any signs of reduced activity, yet his stream of mental activity judged by his answers to questions was decidedly diminished, and most of his responses were either "yes" or "no." A definite impairment of the mood and general emotional reaction was quite evident; he was apathetic, dull, and indifferent, and showed a

decided inco-ordination between the ideas which he expressed and the emotional tone accompanying them. As a result of his inaccessibility it was difficult to obtain an adequate conception of just what was going on in his mind, nor would he elaborate on any of the ideas which he did express. He had no delusions of persecution, but admitted that for several months he had been in communication with "a voice," which sounded like a man's voice, and seemed to come from a long distance away. This voice seemed to have a controlling influence over him and he did very little unless directed by it. Further questioning regarding these auditory hallucinations, however, brought no responses, for he refused to tell any more about them. The boy was well oriented for time, place and person, and showed no impairment of memory for either remote or recent events. An intelligence test could not be successfully made because it was very difficult to obtain his co-operation, but from the previous history and the few responses obtained, it was quite evident that we were not dealing with a case of mental deficiency. He was able to read and write quite well, but his judgment was definitely impaired and he had absolutely no insight into his condition.

From the history of the development of the disease and the fact that the general picture presented by the patient so much resembled the dementia praecox of adolescence, we diagnosed a case of very youthful dementia praeco.

He was taken away from the school, was kept under observation and a tonsillectomy was performed, but several months after the initial examination a deteriorating process was seen to be setting in. The mother reported that he was retaining his saliva in his mouth, was becoming very untidy and uncleanly, would spend four and five hours at a time in the wash-room and that he was becoming dangerous. He had attempted to throw a flat iron and other articles at the father and he had run away from home for several days because, as he explained when he returned, he was afraid that his father would castrate him. On account of these developments it was deemed unwise to attempt to keep him at home and he was sent to a hospital for the insane, where he is at present.

CONGENITAL DEFICIENCY OF SMALL INTESTINE

R. R. McGregor, M.D.

Kingston

Baby M.—Three days old, brought to my office, suffering from persistent projectile vomiting for two days. Child had taken water the first day and nursed at the breast every three hours following. Baby had voided urine frequently but there had been no passage of the meconium. Labour was normal.

Family History.-Negative. Physical examination of child revealed a well-nourished, well developed male chald. Apparently normal in every respect except that the abdomen was distended considerably and that coils of distended bowel could be observed through the abdominal wall. A congenital blockage of the abdominal tract was apparent. A catheter was passed high up into the rectum apparently meeting no obstruction there. The child was sent to hospital and a surgeon consulted. On opening the abdomen a deficiency of the small intestine was found in what appeared to be the upper part of the ileum extending for about two inches. The small intestine above the deficiency was markedly dilated and filled with liquid faecal material. The remainder of the small and large intestine below the deficiency was collapsed. The surgeon opened the end of the dilated portion of the bowel and sewed in a rubber catheter to drain the contents of the over-dilated intestine. The infant died a few hours after operation. An autopsy was performed which revealed no other defects of the gastro-intestinal tract.

It would appear on examining the specimen of intestine that at one time during foetal life possibly in the early months, the small intestine was patent throughout, and that through torsion or anaemia of the area involved, or some undetermined cause, the already normally developing intestine was pulled apart, and development arrested. There were no signs of foetal peritonitis or constricting bands in the abdomen.

Retrospect

SOME RECENT ADVANCES IN THE DIAGNOSIS OF COMPRESSION OF THE CORD*

F. H. MACKAY, M.D.

Within the past decade, studies of the spinal fluid obtained by lumbar puncture have thrown considerable light upon the diagnostic problems associated with chronic lesions of the spinal cord. Within this period the routine serological examination of the fluid has elucidated our conception of the inflammatory lesion, and with a knowledge of the cellular and globulin content, with or without the Wassermann colloidal gold, such chronic infections as neurosyphilis, encephalitis lethargica, disseminated sclerosis and tuberculous meningitis can be fairly accurately estimated. These estimates are all based upon a recognized reaction to the inflammatory process.

It is, however, the non-inflammatory, or rather, obstructive lesions that I propose to discuss at present. It is well known that any lesion of long standing which happens to involve the subdural space and consequently to obstruct the normal circulation of the cerebrospinal fluid gives rise to a characteristically abnormal fluid—the so-named Froin syndrome.

Froin, in 1903, described a condition which he designated massive coagulation, and because of the distinctive yellow colour taken on by the fluid, xanthochromia. This condition is characterized by a yellow fluid which clots on standing and contains a very moderate, if any, increase in cells.

Since that time, many writers, notably Nonne, have confirmed this finding and to-day, every laboratory recognizes in it a valuable aid to the diagnosis of cord conditions. The finding of xanthochromatic fluid whether associated with spontaneous clotting or not, for, after all, the clotting is a matter of the degree of increased globulin, implies an interference with the cerebrospinal circulation, and so a stagnation of the fluid in smaller or larger lacunae. This stagnation permits of the

gradual increase in the globulin content and the taking on of the characteristic yellow colour. The small number of cells found in this condition indicates absence of inflammation inasmuch as inflammatory lesions cause concurrent increases in these two elements.

So overwhelming is the incidence of tumour in the production of this syndrome that the finding of such a fluid has become synonymous with the diagnosis of spinal tumour. The essential condition for its production is not the tumour itself, but the formation of a closed cul-de-sac below the tumour, and it is from this cul-de-sac that the abnormal fluid is obtained.

The theory most commonly held was put forward by Mestrazat, and implies a transudation into the fluid which being trapped in its reservoir is unable to free itself of the transudate through the ordinary channels. Until recently it was held that the abnormal fluid was invariably obtained from below the tumour, when Cushing and Ayer showed that, while this was true, yet a fluid of lesser abnormality could be obtained from above the mass. By means of quantitative tests which are distinctive enough to be used by any laboratory, they were able to show that in the few cases in which they obtained abnormal fluid from above the mass, the abnormality was so strikingly less, when compared with that obtained from below the mass that it did not interfere with its usefulness as a measure of diagnosis. Its usefulness as a diagnostic measure both of the nature of the lesion and also of its location, is at once apparent, and this is especially true when dealing with tumours of the lumbar cord or cauda equina where multiple punctures may be employed for absolute diagnosis.

Although the character of the fluid is of great value in deciding whether one's puncture site is above or below the lesion, equally important is the estimation of the spinal pressure. One striking observation in these cases is the low pressure obtained from below the lesion as measured by the manometer; a very low reading, say 2 to 4 mm. of mercury, is very significant in any case under suspicion.

Within very recent years, since 1920, Ayer of

^{*}Read before the Osler Reporting Society, Montreal, May, 1924.

Boston, whose work I wish particularly to report, has perfected and presented a method by which differences in pressure may be obtained at both ends of the cord. He has shown that puncture of the cisterna magna may be carried out as easily and as safely as puncture of the lumbar sac. In certain situations where puncture of the lumbar sac is insufficient or impossible, especially in cases of tumour obliterating the entire space, it was found necessary to tap other higher lying reservoirs, such as the cervical sac, the cisterna magna or the ventricles themselves. Of all these sites, Ayer has shown that access is most easily had to the cisterna magna, and he has developed a technique which he believes is safe and practical. The procedure is comparatively easy and free from alarming symptoms, either at or subsequent to the time of the puncture. His technique is given as follows:-

The patient is placed on his side as if for lumbar puncture, with neck moderately flexed, care being taken to maintain the alignment of the vertebral column, to prevent scoliosis and torsion and to maintain the lumbar and cisternal needles on the same horizontal plane. With the thumb on the spine of the axis the needle is inserted just above it in the midline, and is pushed through the skin forward and upward in line with the external auditory meatus and glabella, until the dura is pierced. At the proper angle the needle enters the cisterna so as to allow a distance of from 2.5 to 3 cm. between the dura and medulla. The dura is pierced at a distance of from 4 to 5 cm. from the skin surface, in an ordinary sized adult. The greatest distance found in his series was 6 cm. and the least 3.5 cm.

The subsequent condition of the patient showed a striking freedom from the headache so frequently seen after lumbar puncture.

While this method was originally introduced for the purpose of relieving pressure in cases of subarachoid block following meningitis and introducing serum for the same disease, its field of greatest usefulness is found in the early diagnosis of cord compression.

Results obtained in normal cases from simultaneous punctures of the cisterna and lumbar sac, show that the fluid in the subarachnoid space is in free and direct communication between these two points of puncture. Not only

is the fluid derived from either site the same in character as regards cell and globulin content, sugar content and colloidal gold reaction, but also, the pressure readings as indicated by the manometer are identical.

Furthermore, oscillations in pressure due to pulse and respiration, or changes in the pressure level set up by coughing, holding the breath or compression of the jugular veins, are the same at both puncture sites in normal cases. Hence, differences in oscillations or pressure levels at either site can be explained only by some obstructive lesion to the cerebrospinal circulation.

Cisterna puncture, alone or combined with lumbar puncture, is particularly useful in four classes of cases:

1.—For diagnosis or treatment of post-meningitic spinal subarachnoid block. In two of five cases examined under this heading Ayer was able to show that there was a definite block in the communication, and as adhesions are particularly liable to occur about the foramen magnum or in the cervical cord region, differences in the character of the fluid, as indicated in the cellular and bacterial content at the two levels, bore corroborative evidence and permitted successful treatment through the cisternal route.

2.—For early treatment in meningococcus meningitis. Serum treatment has reduced the mortality of epidemic meningitis to 25% and even then, Ayer asks "Why lose even one in four of these cases," and answers that among other reasons usually put forward, is the one that the serum, when introduced through the lumbar sac does not reach the higher levels of the spinal space, and especially the cerebral space, in sufficient concentration to be effec-Clinical and experimental evidence points to the cerebral meninges as being primarily infected, and it has been shown that substances introduced in moderate amounts and under normal pressure into the lumbar subarachnoid space, reaches little higher than the base of the brain. In this series he has been unable to obtain evidence of serum which he had introduced through the lumbar sac, having reached the cisterna during the period of injection. Similarly, injection of 30 cc. of India ink into the lumbar sac of the cadaver barely blackens the base of the brain, but when a similar amount is placed in the cisterna magna not only the base but also the cerebral cortex on both sides is well blackened. Theoretically, then, antimeningococcus serum should be most efficacious in early meningitis if given by the cisternal route.

3.—For diagnosis and treatment of syphilis of the nervous system. In cases where arsphenamized serum is indicated, especially where there is evidence of cerebral involvement this method offers as safe and undoubtedly a more effective route for the treatment.

4.—For diagnosis of cord compression, other than cases of postmeningitic block. We have already discussed the changes in the chemistry and physical charteristics of the fluid lying above and below an obstructive lesion, and have compared their differences. We have seen that the fluid lying below the lesion is distinctly different from that lying above the lesion. We have learned that pressure and oscillatory relations between these two sites are identical in normal cases. Bearing these facts in mind, the simultaneous puncture of the lumbar and eisternal sacs recommends itself on the application of the following criteria:—

1.—Evidence of mechanical obstruction to the free passage of fluid in the spinal subarachnoid space as indicated by:

(a) Pressure relations in the two sites, especially changes in pressure which result from the withdrawal of fluid;

(b) Variations in the normal oscillatory movements of the fluid dependent upon the cerebral pulse and respiration, and

(c) Gross changes in the fluid pressure caused by compression of the jugular veins and by coughing, all indicative of the mechanical interference with the continuity of the spinal fluid column.

2.—Evidence of different chemical composition of the two fluids as shown by comparative protein determinations, variations from the normal, supposedly due to alterations in the meninges, allowing increased transudation of protein into the spinal fluid.

In nine cases suspected of spinal block due to tumour, three showed no evidence of block, one was suspicious and the other five showed definite evidence of block.

Three of these five positive cases have thus far come to operation, and the cause of the block has been removed. The conclusion that puncture of the cisterna magna, alone or in combination with the ordinary lumbar puncture, is a valuable aid to the diagnosis of obstructive lesions of the spinal cord, would appear, at least, rational. More recently, Sicard of Paris has elaborated our diagnostic armamentarium by the use of lipoidal, a heavy, oily fluid which is opaque to the x-rays.

Utilizing the cisternal route, this substance, 1 to 2 cc. in quantity, is injected into the sub-arachnoid space and allowed to fall gradually until it meets with obstruction which in the normal case, would be the bottom of the thecal sac, but in case of tumour its progress would be stayed at the upper limit of the obstructing mass. X-rays definitely localize the substance and so mark out the upper limitation of the tumour.

Similarly the lower border of the mass may be outlined by injecting the oil into the lumbar sac and taking the radiagraph with the patient in the head-down position.

The great value of these newer methods lies in their application to cases in the early stage of development and before definite neurological signs make their appearance.

Sheppard-Towner Act.—If the proponents of the Sheppard-Towner Act would justify the bill, they must submit exact figures indicating that the maternal and infant death rates have been appreciably lowered in those states which have co-operated with the federal government, and that the rates are much lower than those obtaining before this meddlesome legislation became effective, and lower also than those of

the states which have not co-operated, and which may serve in this case as a control. Furthermore, recognition should be made of the tendency toward lowering of maternal and infant mortality rates in accordance with the general lowering of all mortality rates following increased application of our knowledge of sanitation and hygiene.—Jour. Am. Med. Ass., Sept. 13, 1924.

Editorial

ON CHEMOTHERAPY

Y/E are ever searching for means of directly attacking infection; in a sense it is the part of modern scientists to supply this complement to the work of those who discovered that microbes bore disease with them. It was fitting also, that one so closely connected with the subject should give us a name for it, for it was Ehrlich who spoke first of "chemotherapy," or the treatment of infections by means of chemical substances with a specific action on each infective agent. Still, as Professor H. H. Dale remarks in his recent presidential address in Toronto* chemotherapy is not altogether of recent growth. The cinchona bark introduced into Europe by the Jesuits in the seventeenth century was a chemotherapeutic agent whose specific effect in malaria is still the best available: and the same remark applies to ipecacuanha as regards the length of time we have employed it, and its value in the treatment of amœbic dysentery. Modern developments in chemotherapy, however, have come chiefly from the study of the natural antibodies. In these lies the ideal weapon with which to attack infection; they have the closest possible specific affinity for the invading organism, and yet they are perfectly harmless to the body of the patient. There are, however, limitations to the powers of these antibodies in certain forms of infection, and this is the basis for suggesting that synthetic chemistry might produce substances with a similar specific affinity for and consequent toxic action on the protoplasm of the parasite, and always without harmful effect on the body tissues.

It has been Professor Dale's part to point out some of the results which have arisen from this conception, and, by him the advances made and the difficulties

yet to be overcome, are put clearly and attractively before us. Perhaps the fundamental difficulty lies in the fact that this conception implies definite properties in the protoplasm of the organisms, which our actual knowledge of their chemistry does not warrant our defining, although this difficulty does not loom so largely now as it did twenty years ago.

Professor Dale's review gives details of special investigations with which, he says, we may easily feel elated, because they have led to such practical success in treatment: but at the same time it must be admitted that we face baffling discrepancies between "the results of experiment and the theoretical conceptions hitherto available of the nature of the chemotherapeutic process." in cases where we can attack the organism most efficaciously, the mechanism underlying the effect of the drug is not clear. Bayer "205," for example, is a synthetic compound with valuable powers of curing trypanosome infections such as African sleeping sickness, and yet it has little or no obvious action on trypanosomes in vitro (nor, indeed, as a curious fact, in the apparently harmless natural infection in wild rats caused by T. lewisi.). It is evident, therefore, from this and certain other effects, that its action on the trypanosome in the body does not depend solely on its affinity for the or-Changes must also be proganism. duced on the tissues and blood of the host, in combination with which the drug reaches its complete effectiveness.

Again, none of the successful spirochæticides, such as atoxyl or salvarsan, have any directly harmful effects on the parasites if applied in dilutions at all comparable to those which can be safely or effectively produced in the body of the host: but if first partially oxidized the spirochæticide has an immediate and intensely toxic action in vitro. In this

^{*}Progress and Prospects in Chemotherapy, Brit. Med. Jour., Aug. 9, 1924.

case also it is suggested that the tissues serve an auxiliary part in altering the drug so as to make it effective. As still another example of the problem, Professor Dale describes how dysenteric amœbæ in vitro are unaffected by even very high concentrations of emetine, but are killed by certain artificial derivatives of the drug, which, at the same time, are devoid of certain toxic qualities of emetine in man; and yet, the effect of emetine in the dysenteric patient is specific,

whilst these artificial derivatives are ineffectual. Further, it was found that an amoebic infection easily controlled with emetine in man, was quite uninfluenced by emetine when transferred to the cat. "In no way," he concludes, "is it possible to account for these facts without admitting a cooperation of the patient's tissues in the curative action." And this, it seems to him, is a hopeful sign of "new contacts between biochemistry and chemotherapy."

H. E. M.

THE PARATHYROIDS, GUANIDINES AND TETANY

THE most prominent phenomenon following extirpation of the parathyroids is muscular twitchings passing into tetanic spasm. This has been attributed to changes in the nerves supplying the muscles, rather than to the muscles themselves, since such twitchings are not produced in muscles which previously to parathyroidectomy have had their nerve supply removed.

This phenomenon has been attributed to the production of a toxic substance, since by simple dilution of the blood such symptoms could be made to partly disappear, and also because degenerative changes could be demonstrated in the

cerebral ganglia cells.

The results of metabolism studies are numerous and conflicting. Koch (1912) first reported the isolation of methyl guanidine in the urine of parathyroid-ectomized animals. Burns and Sharpe (1916) were also able to demonstrate an increase in the excretion of guanidines in such animals. The further observations of Paton and his co-workers that symptoms of intoxication with guanidines resemble those following extirpation of the parathyroids seemed to strengthen the "toxic" theory.

Since MacCallum and Vægtlin (1909) found an increase in the elimination of calcium in the urine and a decrease in the concentration of this element in the blood in this condition, numerous observations have been made on the inorganic meta-

bolism. Chief amongst these have been noted disturbances in the nitrogen, sulphur, phosphorus, calcium and magnesium metabolism. It appears to be definitely established that there are at least two important changes to be noted, namely, a lowered calcium content of the blood and a diminished phosphorus excretion in the urine. These have been found by nearly all observers to be associated with tetany but the evidence is inconclusive as to the cause of tetany.

In cases of severe acidosis a low blood calcium may be noted without the symptoms of tetany. This applies particularly to the acidosis of diabetes mellitus.

The choice between the two predominant theories of tetany, guanidine intoxication, and disturbed calcium metabolism, appears to have become more simplified by the recent observations of Greenwald (1924) who attacks the technical procedure involved in the isolation of the guanidin bases by the earlier observers. The latter employed mercuric chloride and sodium acetate. It has since been shown that mercuric acetate oxidizes creatine, a normal constituent of urine, to methyl guanidine glyoxylic acid, from which methyl guanidine may be obtained. Greenwald further attacks the methods of later observers and from his own work concludes that guanidine nitrogen does not constitute more than one half of one per cent. of the total nitrogen in urine of parathyroidectomized ani-I. M. RABINOVITCH

ON CRIME AND PUNISHMENT

N the August number of The Statistical Bulletin of the Metropolitan Life Insurance Company attention is called to the large number of homicidal assaults which have occurred during recent years in the United States. The figure given is more than 9,000 annually; seventeen times the number which would have occurred if the percentage which occurs in England and Wales had prevailed in the States. The homicides which were committed in Chicago in the year 1922 exceeded the number which occurred in all England and Wales in that year. Furthermore, the toll of homicides per 100,000 of population is nearly six times that existing in Canada. It is hinted that inability to apprehend, indict and try assailants, and to make prompt and definite disposition of homicidal cases are important factors in accounting for this situation. This insurance company is about to make a persistent attempt to secure all data on the legal procedures connected with the homicidal cases occurring among its policy holders. the problem is of great importance to its millions of policy holders is shown by the fact that in 1923 the company paid out in claims for this class of death alone the sum of \$724,000.00. The collection of facts regarding the trial and disposition of these homicidal cases appeared to be beset with much difficulty, and satisfactory information could be gathered only in 146 out of the 446 homicidal cases which occurred among their policy holders during the last six months of 1922. Of these 146 cases of murder or manslaughter the information was obtained that thirty-two fell into the class of justifiable killing; that is, death was inflicted in self defence in seven cases or by an officer of the law in the line of duty in twenty-five cases. There was a definite indictment in sixty-nine cases; the remaining forty-five cases were not

indicted; in one-third of them the assailants are still at large; in twenty-two the assailants committed suicide and in eight the evidence was insufficient to warrant indictment. Of the sixty-nine who were indicted, eleven escaped trial; sixteen were discharged as not guilty; of the forty-one judged to be guilty, thirty-five are serving time, with an appeal pending in six of them. Summarizing the results. The Statistical Bulletin asserts that out of the 146 homicidal cases of which 114 were manslaughter or murder cases, thirty-five are serving time in the penitentiary, one is on parole, one is fined, and one has been executed. All the remainder are either unapprehended, have been set free, or are awaiting trial.

This certainly is a strong indictment of the results of judicial procedure in the United States. The result of the trial in Chicago of the two youthful murderers has certainly aroused a strong expression of public condemnation.

We believe the number of homicidal assaults which have occurred in Canada during the past few years, judging by the records which appear in our daily press, have greatly increased.

Our profession should take these statements made by one of our most reputable insurance societies very seriously to heart, and ask how far it is wise to deal leniently with crime and especially with the crime of murder. Some in the profession are inclined to think of punishment only as it affects the individual criminal, and so far as may be possible to plead some mental defect or temporary brain storm. In every society, civilized or only partially civilized, punishment must be regarded not merely as punishment for crime committed, but also as a deterrent to prevent its repetition; and unless punishment follows promptly and surely its chief value in society is lost.

TRYPARSAMIDE IN LATE NEUROSYPHILIS

WITH the introduction of salvarsan by Ehrlich and the succession of modifications of it and of other arsenicals. the war against syphilis acquired a new lease of life. Subsequent trial and experiment did not, however, seem to justify the first sanguine expectations of its value in cases in which the nervous system was involved; more particularly in late neurosyphilis. In fact a few years ago pessimism was so great that many considered that antisyphilitic treatment, escpecially with arsenic, was practically useless where the nervous system was the locus morbi. However with more intensive treatment, with direct injection into the spinal canal, and more particularly with cistern injection the clouds seemed to lighten somewhat, though never to the extent of acquiring a rosy tint.

With the synthesisa of tryparsamide in 1915 by Heidelberger and Jacobs, its biological essaying by Pearce and Brown, and its extended clinical trial in several institutions under the auspices of the Rockefeller Institute it appears to have pre-empted a domain of its own—the domain of late neurosyphilis. Its administration has yielded satisfactory results in a considerable percentage of cases of advanced cerebro-spinal syphilis, of tabes, and of general paresis; in some instances the improvement was far greater than had hitherto been attained.

The modus operandi of the drug appears to be based on its ability to penetrate into the central nervous system beyond that of any other arsenical, on its remarkable tonic or alterative power, and lastly on its spirochæticidal power which, though relatively low, is of considerable value. The drug as a whole seems to act mainly by reinforcing the natural immunization powers of the central nervous system.

In syphilis of the nervous system there may be involvement of the parenchymatous tissue or the interstitial tissue or

both. In the medical mind such diseases as tabes or general paresis are generally associated with parenchymatous degeneration of the nerve cells and their processes, a condition which is therapeutically unalterable; in a certain sense that is true. But it must not be forgotten that in the majority of cases of neurosyphilis, if treatment is not commenced too late, there is not yet degeneration; there is inflammation of the meninges, of their prolongations between the various lobes, sulci and adnexa of the brain, as well as vascular and perivascular inflammation, or infiltration. This inflammation, which for all practical purposes may be considered as interstitial, may by pressure on the subjacent or adjacent brain tissue produce any of the symptoms of tabes or paresis, before any degeneration of real brain tissue has occurred and this is the condition amenable to treatment in which tryparsamide appears to have made its mark.

At the present, tryparsamide does seem to be giving good results, and is, therefore, creating widespread interest; discussions on its action were a feature in the programmes of the last annual conventions of the American Medical and the American Neurological Associations. It is worthy of mention, however, that on these occasions considerable emphasis was laid on the possibility of injury to the optic nerves as a result of the use of this drug. In defence it was stated that the frequency of optic neuritis from tryparsamide was relatively not much greater than is seen in untreated cases, and in cases treated by other methods. ally, the suggestion has been made that on account of its ineffectiveness, if not harmfulness in primary and secondary syphilis, that it might be advisable to keep it out of the hands of the general practitioner in the meantime.

NORMAN VINER

THE INFLUENCE OF DIET ON THE DEVELOPMENT OF THE DENTAL STRUCTURES

INTIL very recently the prevention of carious and defective teeth was looked upon as the concern of the dentist rather than of the physician. There is an increasing realization to-day, however, that all the bony structures in the body, including the teeth, are influenced to a great extent by the state of nutrition in the body, and especially is this the case during the period of active growth in While oral prophylaxis is by childhood. many still regarded as the foremost factor in the preservation of our dental structures, careful observations carried out recently would indicate that the diet is also a very important factor in the quality of the dentine enamel deposited in growing children. In a recent number of the British Medical Journal, August 30, 1924, the influence of different diets on the development of the teeth, and their tendency to early decay is presented to us in a paper by May Mellanby who has carried out a series of experiments first on puppies and afterwards on growing children. She shows that some dietetic factors tend to help and others to hinder the formation of well calcified. evenly arranged teeth. In those foods which tend to favour the formation of good teeth are to be found substances rich in a vitamine, closely allied to vitamine A. This group of substances includes cod liver oil, animal fats (excepting lard), milk and the yolk of egg. Amons the foods which apparently fayour the development of defective teeth are cereals, and among these oatmeal occupies a prominent position. In addition to the influence of diet, Miss Mellanby has shown that exposure of an animal to sunlight or other source of violet ray radiation has an important influence on the growth and nutrition of the teeth. The interaction of the dietetic and environmental influences on tooth formation is certainly very close. In the past, children's teeth have been regarded as generally well formed and yet very liable to become carious. Miss Mellanby found

when examining under the microscope a large number of children's teeth, that the more perfectly formed teeth showed the least tendency to caries, but more recent and closer examination has revealed that when a child's teeth were well formed but became carious early, the secondary dentine present was poorly calcified; on the contrary badly formed teeth free from caries or in which caries had been arrested had well formed secondary dentine. Thus, although the formation of the original enamel and dentine was as a rule a good indication of the susceptibility of a tooth to caries, the presence and structure of secondary dentine indicated a second line of defence dependent on the resistance set up in the body and particularly in the tooth itself. Fresh observations by Miss Mellanby have recently been made. Three groups of children were taken. One set was placed on a diet which included cod liver oil and eggs, but no oatmeal. The next group received a diet similar on the whole to Diet A; its chief difference was that it included oatmeal, had very little egg, less milk than the previous diet, and no cod liver oil. The third group consisted of children chosen from patients on the ordinary hospital diet. The groups were selected so as all to be comparable to one another, in age, duration of institutional treatment, etc. The effect of the three diets on the patients was carefully watched, and while there appeared to be little difference in the general health of the three groups, the condition of the mouth and the appearance of the teeth of each child was charted at the beginning of the experiment and at intervals of a few months. After periods which varied on an average of seven and one-half to eight months all the teeth were again examined and the results again charted. It was found out that the first diet gave distinctly the best results. The second diet gave the poorest results, while the third diet gave intermediate results. In other words, the diet on which the best results were obtained was rich both in calcium and the calcifying vitamine and contained comparatively little cereal none of which was in the form of oatmeal.

Dr. Mellanby promises to give us more detailed results in a future paper. So far as her experiments go they appear to indicate that when a large amount of cereal and especially of oatmeal enters into the dietary of children, it has an unfortunate influence on the formation of the dentine in children's teeth.

SOME DANGERS OF THEORY IN MEDICINE

DIFFICULT as it is, it behoves us occasionally to climb out upon the bank to see how and whither the stream is flowing. Under the above title in a recent number of *The Nation and Athenaum*, Dr. Harry Roberts has attempted to criticize, that is to judge, the methods employed in the science of medicine.

The number of truly great men in medicine has been comparatively small and it is "to the application of a higher sort of common sense, and to the slow, laborious methods of inductive science, that nearly everything of value in the medical art is traceable." There is a tendency to-day to belittle the patient, toilsome labours of the scientific observer in physiology, chemistry, bacteriology, and pathology. In truth many and many a time no important results beyond the accumulation of facts have been achieved, but who is there who will deny that one single, apparently isolated fact learnt to-day may not gain new importance when linked up with others learnt Therefore, we must not to-morrow? "cast stones at the labours of the laboratory because, forsooth, they lead nowhere.'

There is a danger, says Dr. Roberts, that guessing may become the order of the day and he calls to witness the "New Psychology." On the other hand, attention must be drawn to the brighter side of the picture, to the attempt of Sir James Mackenzie and his band of workers at St. Andrews. There in a stationary community, where patients may be followed for years, the course of disease is being studied in the hope of unravelling its beginnings. Attention has been directed to such simple and commonplace symptoms as fatigue. Gradually differ-

ent forms of this symptom are being recognized, and it seems probable that when disease develops later, the true meaning of the fatigue, experienced years

before, may be read.

Dr. Roberts also lays bare the danger of basing the art of medicine at the present time upon "the ultimate nature of things" rather than upon "even incomplete inductive knowledge" and here he gives as an example the "electronic reactions" of Dr. Abrams. Dr. Roberts would seem to be taking Dr. Abrams and his theory, said to be based upon the vibrations of electrons of matter, too seriously, but apparently Dr. Abrams has a following even among professional men in England and America as well as amongst the laity. In one instance at any rate this method of diagnosis and prognosis made at a distance by testing a drop of blood with the "oscilloclast" was doomed to failure. A shrewd man of medicine—and a wit as well—submitted blood of a healthy Plymouth Rock cock for examination. The diagnosis returned was a long list of diseases like that from which one of the adventurers in Three Men in a Boat imagined he was suffering; the prognosis, however, was to say the least, optimistic! Strange as it may seem, on this occasion the oracle omitted to tell the religious belief of the patient!

When men are gods then will the science of medicine base its teachings upon the "ultimate nature of things," but that time is not yet. We need not despair, however, says Dr. Roberts; look how modern medicine has dealt with malaria, yellow fever, bilharzia and myx-cedema.

A. M.

Editorial Comments

ABOUT TELLING THE TRUTH

When two motorists collide or have a near collision, the phenomenon of "the accusing eye" makes its appearance. The party of the first part casts a stare of rage, of contempt or of offended dignity at the party of the second part, which is likely to be returned with interest, or accompanying the accusing gaze with such civilities as "Y' big boob!, where d'ye think y're goin'?" to be answered by the accused "What d'ye mean, travellin' fifty miles an hour past a corner?"

This of course is the reaction of the natural man, or rather the animal in the natural man. and entirely analogous to the raising of the fur on the back of the cat, or the showing of the teeth and the bristling neck of the dog in the presence, not necessarily of a known enemy but even of a suspected enemy. Its idea is primarily that of intimidation, and in the case of the human animal this also includes the placing of a net of accusation about one's opponent which will rob his attack of some of its vigour, and naturally the party which can first envelop its opponent in a web of implied guilt or surround him with an aura of uncertainty, has the immediate advantage in a rough and tumble decision; whereas a later unbiased discussion may entirely alter the judgment. It goes without saying of course, that the one who is in the right, so far as the merits of the case go, may be the loudest and the most profane in the primary clash of expletives, but it is not upon the loudness of his voice nor the rancour of his accusations that he wins his case before the Court. In fact by such an attitude of overstatement his good case may be weakened, or even discredited entirely.

Some of these irrelevant observations are suggested by the use, for an together creditable purpose, namely,—the prevention of drug addiction,—of a quite discreditable method of erroneous and exaggerated statement such as has been put forward by the "International Narcotic Education Association," in which it was announced that there were one and three-fourths million drug addicts in the United

States; that one-fourth of a grain of heroin will cause addiction in a child, and that one ounce will make two thousand addicts; and also that "the growth of narcotic addiction in the United States and the world over is the most alarming symptom of the new century."

These statements lose much of their weight when set over against those of Kolb and Du Mez of the United States Public Health Service, and quoted in the *Journal of the American Medical Association*, June, 1924.

After considering the reports of the Bureau of Internal Revenue, army findings and clinical reports, estimates made from average dosage, and available supply of narcotics, as well as reports of investigations by the States of Tennessee and Pennsylvania, and of a committee appointed by the Secretary of the Treasury, they come to the conclusion that there are approximately 110,000 addicts in the United States. In all conscience, 110,000 is bad enough and a cause for serious international concern, but to make it ten times the number for the sake of emphasis, is, to put it mildly, "a bit thick," and tends to shake one's confidence in statements for the purpose of propaganda.

Some time ago The Ladies Home Journal, a periodical with an immense circulation and of eminent respectability (though in our young days its jokes were a bit risqué—we hope they are better now) sent a person to investigate the drink question in Montreal, and this gentleman discovered that in that great and wicked city of nearly one million inhabitants, during 1921 and 1922 there were twelve thousand and forty-eight persons arrested "not shouting drunk, not fighting drunk, not staggering drunk, but hopelessly drunk 'lying drunk' in a public street or a public place." The writer improved his story by the statement that the City Recorder had furnished him with the figures.

That the Recorder answered by the polite rejoinder in a signed statement, that the writer "had deliberately and knowingly perverted the truth" and, that the number found 'lying drunk' would not exceed five per cent of the figures quoted, during the two years quoted," while satisfactory to seekers after fact, does not abolish for everyone the first accusing look of the propagandist.

A judicial mind which seeks the truth, first, last and all the time, or as some in Boston say it, "The Cabot truth" and nothing but the truth, is not to be found everywhere. The truth is likely to be coloured according to our politics, our theology or our enthusiasms, and even a diagnosis may be coloured according to our favourite disease.

"For och! Mankind is unco' weak,

And little to be trusted;

Where self the wavering balance shakes,

'Tis rarely richt adjusted."

No one will for a moment deny that drug addiction is a great evil, and a menace, but that is no warrant for hysterical exaggeration; the most ardent Montrealer regrets that his city has such an unenviable popularity with those to whom the law is irksome in their own homes; but matters are not improved by verbally littering its streets with the jetsam of inebriation.

In each of these instances, the propagandist adopts the method of persuasion by intimidation, and by making exaggeration gross enough seeks to place the burden of disproof upon the accused and thus gain a mob verdict before fact and reason can come into Court.

Needless to say, the reaction from such overstatements is, in both these instances, unfortunate, because it focuses general attention upon questions of the veracity of partisans rather than upon the essential evils of racial and individual deterioration inherent in the traffic in narcotics including alcohol.

A. H. GORDON

THE JOURNAL TO CANADIAN MEDICAL MISSIONARIES

"Virtue brings its own reward" and the decision of the Executive to send the *Journal* gratis to our Canadian colleagues engaged in medical missionary work must have received the approbation and endorsation of every member of the Association.

In this instance, however, we are further rewarded by the expressed appreciation and gratitude of the recipients. We have before us numerous letters received from medical men

and women in China, India, and Bengal all conveying thanks to the Association and instancing the practical assistance already derived from the articles in the *Journal* as well as an appreciation of the sentimental bond attaching to a journal of Canadian publication. Dr. B. C. Oliver, Banswara, S. Rajputana, Editor of the *Journal of the Association of Medical Women in India* further expresses an intention to actively abstract the articles of the *C.M.A.J.* for her own publication.

We at home little realize the tremendous amount of work done and offering at the hospitals and dispensaries in the densely populated countries, a task performed by a staff entirely inadequate but devoted and loyal to the chosen duty. Any assistance the Association can render is a privilege but not less a duty. A. T. B.

SIR WILLIAM OSLER MEMORIAL VOLUME

Under the auspices of the International Association of Medical Museums, an Osler Memorial Volume is being edited by Dr. Maude E. Abbott and is now approaching publication. It will contain some three hundred pages comprising about sixty articles written by Sir William Osler's friends and associates, many of whom were his pupils. These appreciations of his life and character and of his manifold activities are arranged so that a series of pictures is given of him during the years spent in Canada, in Philadelphia, in Baltimore and finally in England as Regius Professor of Medicine at Oxford. The volume will be well illustrated with photogravures and half-tones. One of the most interesting sections of the book is a classified bibliography of Osler's writings that fully reveals his extraordinarily large literary output. The book closes with a bibliography of "writings about Osler."

The volume is being published by subscription and those who subscribe ten dollars or more will receive a copy. Dr. C. F. Martin, Dean of the Medical Faculty, McGill University, will be glad to receive subscriptions in trust for the publication fund. The Journal heartily commends this appeal to its readers for many of the lessons of the life and the work of one of the greatest of Canadians may be learnt from this forthcoming volume.

Men and Books

THOMAS SYDENHAM (1624-1689)

On May 20th of this year the Académie de Médecine in Paris celebrated the tercentenary of Sydenham's birth, representatives of the Royal College of Surgeons and the Royal Society of Medicine being present. "If in England Sydenham be called the 'British Hippocrates' then in France," said Professor Chauffard, "Trousseau is held to be the French Sydenham."

Thomas Sydenham was born at Wynford Eagle, Dorset, in a beautiful house which stands to this day. At the age of 18 he entered Magdalen Hall, Oxford, as a fellow-commoner, but his stay there was not long for he fought in the civil war on the side of the parliamentary forces. At the advice of Dr. Thomas Coxe he began the study of medicine at Oxford in 1647 and was created bachelor of medicine in 1648 by command of the Earl of Pembroke, Chancellor of the University, without having taken a degree in Arts. The same year he was elected to a fellowship in All Souls' College where he pursued further his studies, as his knowledge of medicine at that time was, to say the least, scanty. Again Sydenham served as captain of horse. Finally he began to practice medicine in Westminster in 1655, and in 1659 studied in Montpellier, that ancient seat of medical learning. He obtained the license of the Royal College of Physicians in 1663 but was never elected fellow, though he was well thought of by that body. He did not take the degree of M.D. till 1676 and then not at his own university, Oxford, but at Combridge where his eldest son was a pensioner at Pembroke College. After this time his position as a physician was assured but his health became impaired, and he was unable to try the examinations.

Details of Sydenham's life are scanty but we know that he continued to practise and to write despite frequent attacks of gout of which his masterly description, dictated as he was unable to hold a pen, remains as a model. He died in 1669 at his home in Pall Mall and was buried in St. James's Church, Westminster.

It has been said that it is to Mayerne, Glisson, and Sydenham that the establishment of the

study of clinical medicine in England is due, but the greatest of these three men was Sydenham. "He was a man of great doubt" and as Dr. John Brown has written of him, he was placed in the midst of a mass of errors and prejudices, of theories actively mischievous, at a time when the mania of hypothesis was at its height, and when the practical part of his art was overrun and stultified by vile and silly nostrums. He believed in and practised the doctrine of Hippocrates that medicine depends not on theory but on observation, and with "the ancient and serious diligence of Hippocrates,"to borrow a phrase of his own-he was the first to attempt to arrive at general laws about the prevalence and the course and the treatment of disease from clinical observation. Concerning his opinion of observation the author of Physic and Physicians gives an interesting anecdote. Thomas Dover, the "physician and buccaneer," who lived in his house, and Sir Hans Sloane, whose immense library is now in the British Museum, were actual pupils of Sydenham and were taught by him in a very practical way. When Sloane came to Sydenham with a letter of recommendation from a friend which described him as a ripe scholar, a good botanist, a skilful anatomist, etc., Sydenham's comment was:-"All this is mighty fine; but it won't do! Anatomy-botany-nonsense! Sir, I have an old woman in Covent Garden who understands botany better; as for anatomy my butcher can dissect a joint full as well:-No, young man this is stuff; you must go to the bedside, it is there you can alone learn disease."

Let it not be thought that Sydenham entirely disregarded the work of those who went before him. He sought in three ways to advance medicine: to give accurate descriptions or natural histories of diseases, written without any preconceived idea, separating them into their various species, and distinguishing the essential from the accidental symptoms; to establish a fixed principle or manner of treatment, founded upon experience; and to search for specific remedies, which he believed must exist in considerable numbers, though he admitted that the only one which had been discovered at his time was Peru-

vian bark. It must be said that Sydenham exaggerated the number of specific remedies and the specific nature of disease. He borrowed the idea of an "epidemic constitution" from Hippocrates and this in the years 1661 to 1664 had ague as its basis, and in 1665 and 1666 came the plague at which time all febrile diseases, pleurisy, pneumonia, etc. assumed a plague-like character, and in 1666 to 1669 there was a Constitutio variolosa and small-pox gave the key-note, so to speak, to all the acute diseases prevalent during those years. Later in the minds of lesser men this idea wrought harm, for instead of closely searching for causes any increase in mortality was put down to a "genius epidemicus" or some such mysterious influence.

Sydenham's first book was Methodus curandi Febres propiis observationibus superstructa, London, 1666, sm. 8vo by which, as Osler puts it, "the fetters of a thousand years in the treatment of fever were shattered....." The best edition of his collected works was edited by W. A. Greenhill for the Sydenham Society in 1844. All of Sydenham's works originally appeared in Latin dress but the authority on the subject, the late Dr. J. F. Payne, considered that Sydenham wrote them in English and that Dr. Mapletoft and Gilbert Havers translated them into a Latin which was "somewhat ambitions and rhetorical" as any candidate who till the present year tried the examinations for the M.R.C.P. (London) well knows.

The Regius Professor of Medicine at Oxford, the late Sir Henry Acland, had painted for his room in the University Museum, a three-panel picture presenting portraits of Linaere, famous in Letters; Harvey, in Science; and Sydenham, in Practice; three illustrious British physicians who present a combination of characteristics which should be the aim of our profession.

A. M.

Resuscitation. — Yandell Henderson, New Haven, Conn., urges that physicians must learn the principles and methods of resuscitationboth the prone pressure method of artificial respiration and the principles involved in counteracting respiratory failure by inhalation therapy. The chief principle of this therapy is that of using a mixture of oxygen and carbon dioxid. Carbon dioxid to stimulate the respiratory mechanism to full deep breathing; to flush and flood the blood in the lungs with oxygen, and to ventilate out of the blood any volatile toxic substance. To combat respiratory failure in this way is to use nature's own agencies to assist nature toward recovery. Occasionally a clever interne may extemporize resuscitation apparatus out of a tank of carbon dioxid from the pathological laboratory, one of oxygen from the anaesthetist, and a spirometer from the metabolism room, and thus may save a life. It is hard work, but it can be and has been done. In general, however, if the methods described are to accomplish all that they should, all general hospitals must be equipped with inhalators specially designed for this purpose, and the staff must become accustomed to using them.-Jour. Am. Med. Ass., Sept. 6, 1924.

Intraperitoneal Haemorrhage from Ruptured Ovarian Cyst.—Louis E. Phaneuf, Boston, reports three eases. In 1923 he operated on two women with severe intraperitoneal haemorrhage giving rise to alarming symptoms. The first case was diagnosed as a ruptured pregnancy; the second was presumed to be an ovarian cyst with twisted pedicle, complicated by acute appendicitis. At operation it was found, in both cases, that the haemorrhage was due to a follicular cyst of the ovary. In the third case the bleeding was issuing from a small rent in a corpus luteum of the right ovary. Previous to 1900, the literature is not clear as to the haemorrhages into the peritoneal cavity caused by ruptured follicular and corpus luteum cysts. Up to that time these haemorrhages were not clearly differentiated from those resulting from extra-uterine pregnancy. Since 1900, the literature contains a number of case reports, each writer having met but few cases. In most instances, the true diagnosis was established after the opening of the peritoneal cavity, a preliminary diagnosis of ectopic pregnancy or acute appendicitis having been made.—Jour. Am. Med. Ass., Aug. 30, 1924.

Abstracts from Current Literature

MEDICINE

A Case of Trypanosomiasis Treated with Tryparsamide. Morgan, H. J. Am. Jour. Med. Sc., June, 1924.

The patient was a white female aged fortyone years, a missionary to the Belgian Congo,
where she contracted the disease in October,
1919. The onset was with attacks of fever and
lassitude, and two months later, there was
noted general glandular enlargement and a
crescentic and annular erythematous rash appeared. The rash disappeared after eight
months, but the lymphatic enlargement, with
attendant undernutrition and asthenia persisted.

In February, 1922, in addition to the above, there was diplopia, ataxia, tremor, drowsiness, disturbance of taste and smell sense, and In July, 1922, Trypanosoma amenorrhoea. gambiense was demonstrated in the blood, cerebrospinal fluid, and lymph glands, and she was given three doses of atoxyl, with apparent arrest of the progress of the disease. After this, she received ten doses of "Bayer 205," with steady improvement, so that in December, 1922, only slight asthenia and anorexia remained. In January of 1923, however, a relapse occurred, and in addition she showed signs of mental deterioration, "lightning pains," etc.

She was admitted to the hospital of the Rockefeller Institute for Medical Research, Feb. 26, 1923, complaining of weakness, unsteadiness and drowsiness. There was general tremor and muscular weakness, a positive Romberg and an unsteady gait. A Babinski reflex was present on the left side. She was somnolent, and fever of 99.5° to 102° F. was noted. Trypansomes were absent from the blood, cerebrospinal fluid, and an extirpated lymph node. Wassermann reactions on the blood and cerebrospinal fluid were negative, the fluid showing globulin +++ and thirty cells.

As there was no change in her condition after three weeks rest and symptomatic treatment, she was given ten doses of tryparsamide totalling 23.0 grams of the drug. Symptoms

and physical signs showed prompt abatement. She ceased to be febrile after the first administration, and gained steadily in weight, with marked improvement in her general condition. She was discharged symptomless and apparently cured on May 24th, 1923, but her cerebrospinal fluid still showed globulin + and twelve cells.

The patient was readmitted to the Rockefeller Hospital in October, 1923, for a second course of treatment. There were no symptoms at this time, and physical examination was negative. The spinal fluid showed only three cells and a trace of globulin. In March, 1924, she remained in excellent condition.

A. T. HENDERSON

Coronary Arterial Occlusion: A Perfectly Definite Symptom-Complex; The Report of Thirteen Cases with Autopsy. Gordinier, H. C. Am. Jour. Med. Sc., 1924, elxviii, (August) 181-201.

The cases were carefully studied and each one was found to present the symptoms and signs which are now considered diagnostic of blocking of the coronary artery followed by infarction of the myocardium. Five of the patients died and in the single case where a postmortem was done a thrombosis of the descending branch of the left coronary artery was found.

In summarizing the chief points of interest Gordinier emphasizes the sudden substernal pain, or pain in the upper abdomen, and the pinched ashen-grey appearance of the patient's face. A feeling of impending dissolution is generally experienced. There is evidence of acute loss of cardiac compensation with emphysema of the lungs, orthopnoea, and moist râles are heard at the bases of the lungs. The pulse is very rapid, thready, and is easily obliterated by the finger and there may be almost any form of arrythmia. After the severe pain a sudden drop in the systolic blood pressure takes place.

Examination of the heart shows a very feeble impulse, if it is palpable at all, distant heart sounds, and often a tic-tac, or gallop, rhythm.

If the infarct does not involve the posterior surface of the heart a pericardial friction may be heard for a brief period of time, a few hours or a day or two after the sudden pain. The condition may be differentiated from simple angina pectoris by a short-lived fever and a polymorphonuclear leucocytosis. The electrocardiogram shows inversion of the T wave and an arborization block.

In cases of thrombosis of the right coronary artery or its branches there are often, in addition, a large tender liver, and signs and symptoms of infarct of the lung. Where thrombosis of a branch of the left coronary artery is present there is a sudden onset, or recurrent attacks, of pulmonary oedema and often plugging of a cerebral vessel or of the vessels of the limbs or abdominal organs.

A. Malloch

The Essential Signs of Arterio-Sclerotic Disease. Evans, G. Brit. M. J., July 5th, 1924, vol. II, p. 1.

Slowly but surely more is being learnt about the different forms of disease included in the general term 'arterio-sclerosis." A classification may be made in two ways; firstly, according to actiology and, secondly, according to morphology, when the terms "nodular," diffuse hyperplastic," "senile," and "Mönckeberg's sclerosis" are applied. In this paper Evans is chiefly concerned with diffuse hyperplastic or arterio-capillary fibrosis and for him the lesions are caused in the first instance by an active inflammatory process followed at a later stage by degenerative changes. The finer branches of the vascular tree are mostly affeeted, such as those of the kidney and spleen, whilst the lesion is rarely found in the heart and skeletal muscles. All stages may be observed at one and the same time in the kidney or spleen. The endothelium of the arterioles proliferates and Evans holds that this proliferation precedes any degeneration. He states that "from our knowledge of the function of endothelium and its behaviour under pathological conditions it is not, I think, open to question that the endothelial proliferation is evidence of inflammation-" Later the endothelium undergoes fatty degeneration and occlusion of the lumen results, other cells of the intima also proliferate; outside of this, new layers of elastic tissue are formed, there may be hypertrophy of the media, and occasionally there is a suggestion of thickening of the adventitia.

In those cases of arterio-sclerotic disease where the course is very rapid, the two outstanding examples of a fatal termination are due to cerebral haemorrhage and angina pectoris, so in general it may be said that the cardinal sign of the disease is haemorrhage and the cardinal symptom is pain. It is important, Evans says, to realize the true significance of haemorrhage; it cannot result merely from high blood pressure, or even a sudden rise in this pressure, but there must be a weakening of the wall of the vessel. That the high blood pressure view is inadequate is proved by the fact that there are many people living who have high blood pressure and yet there has been no haemorrhage; on the other hand, cerebral haemorrhage is not uncommon in arteriosclerosis with a normal blood pressure. In any series of fatal cases of cerebral haemorrhage there are a fair proportion which show no cardiac hypertrophy post mortem. The activity or increase of the vascular lesion is responsible for the haemorrhage as it is in some instances of gross haemorrhage in encephalitis lethargica; here the haemorrhage is evidence of the activity of the disease. Evans considers that a small haemorrhage not angiospasm is the cause of the minor hemiplegic attacks which are sometimes seen.

If haemorrhage is taken as a sign of arteriosclerotic disease then the clinician should look for it. It should be recognized, as it already is of recurrent epistaxis, that haemorrhage from the lungs, kidneys, stomach, intestines, or uterus may spell arterio-sclerotic disease. The fundus oculi should be searched for minute haemorrhages, as the work of Foster Moore has provided one of the links between retinal and cerebral haemorrhage. Fine retinal haemorrhages may be the important sign in the differential diagnosis between neurasthenia and arterio-sclerotic disease. Evans points out, as others might in criticism of his view of arteriosclerotic disease, that thrombosis may precede haemorrhage but thrombosis also follows disease of the vessel wall.

It is more difficult to judge the significance of pain than it is of haemorrhage in the discase for the former may be due to the effects of arterial disease or to the arterial disease itself. Just as there is tenderness on pressure over the site of femoral thrombosis so there may be acute excruciating local pain in the case of arterial embolism and this pain must be distinguished from that produced by deficient blood supply in intermittent claudication where it is a secondary effect of arterial disease. Although arterio-sclerotic disease is generally painless, Evans has on occasions noted tenderness over the temporal artery and once over the transverse cervical vessel. The writer closes his interesting paper with the observation that: "At the present time the aetiology of arterio-sclerosis is veiled in obscurity, but the opportunities of discovering the causation will be multiplied when we are in a position to recognize its onset and follow its course clinically. To do this we must study the signs and symptoms of activity of arteriosclerosis; we must, in fact, learn the symptomatology of arterio-sclerotic disease." A. M.

SURGERY

Acute Pancreatitis. Eggers, Carl, Annals of Surgery, August, 1924.

The writer includes under this heading what the textbooks describe separately as acute haemorrhagic pancreatitis, apoplexy of the gland, suppurative pancreatitis, and necrosis of the gland, because he believes them to be various stages in the same disease.

There are two viewpoints regarding the cause of the disease:

1. That it is due to the entrance of bile or duodenal contents into the pancreatic duet and that the symptoms are due to infection or to ferment action.

2. That it is an infection carried to the pancreas by means of the lymphatics.

A résumé of the literature in reference to these theories is given.

Six of his own cases are reported in full from which he makes the following deductions:

1. That infection by means of lymphatic extension played no rôle in any of the cases.

2. That regurgitation of duodenal contents may have played a rôle in as much as the onset in three of the cases occurred a few hours after a heavy meal.

3. That the gall bladder and bile probably in

some way were connected with the development of acute pancreatitis. In five patients gall stones were found and in the sixth a diseased thickened gall bladder.

The important symptoms are pain, vomiting, and collapse. The first is characterized by its severity and sudden onset. It tends to be colicky and is mostly situated in the epigastrium frequently radiating to the back and shoulders. Usually it is steady and never lets up. Vomiting in the severe cases recurs every few minutes and persists for one or more days and occasionally until operation or death. Symptoms of collapse are frequently present and in the very severe cases there is eyanosis.

The lack of physical signs as contrasted with the severity of the symptoms is one of the striking features of this disease. The most important sign was exquisite tenderness over the entire upper abdomen, perhaps most marked just above the umbilieus and to the left of the median line.

The treatment is surgical. Best results are obtained by early operation.

ALBERT ROSS

Carbuncle and Its Treatment by Magnesium Sulphate. Morison, A. E. (the late), Brit. Med. Jour., April 19, 1924, page 703.

The writer defines a carbuncle as a form of localized infective gangrene. As a rule it is found in parts of the body whose blood supply is poor and which have been exposed to slight trauma. It is especially frequent in elderly people suffering from some blood dyscrasia such as diabetes. In these the presence of sugar in the blood impoverishes its nutritive properties. Any slight break of continuity of the skin in such subjects favours the entrance of organisms and produces conditions favourable to their growth. In these circumstances gangrene of the tissue occurs with all the typical signs and symptoms of an infective or moist gangrene.

The course is somewhat as follows: The patient notices for some days an itching and stinging sensation followed by stiffness and swelling of the skin in that region. The part becomes raised and painful. Temperature may not be raised more than one or two degrees. A rigor sometimes occurs and generally there is a feeling of restlessness and malaise. Soon a white spot of pus appears in the centre of the

raised and reddened area. The surrounding skin becomes infected. Constitutional symptoms become more marked. Pain is severe and constant. Sleep is obtained only in snatches. Spread of the disease is only limited by the powers of the surrounding tissues to set up an obstructing area of defence around the infected area. When this occurs a large slough of skin and subcutaneous tissue is thrown off.

During the last six years the writer has treated twenty-eight cases of carbuncle with no deaths, by applying to the whole of the inflamed area a paste of magnesium sulphate.

The method of preparing magnesium sulphate is as follows: With 1.5 lb. of dried magnesium sulphate are mixed eleven ozs. of glycerine and carbolic, or pure glycerine. The dried magnesium sulphate is in the form of a fine powder which contains twelve per cent less water than the ordinary commercial Epsom salts. The glycerine is put in a hot mortar and the sulphate added slowly, stirring and mixing with a warm pestle all the time. The result is a thick white cream, so hygroscopic that if exposed to the air it rapidly absorbs moisture and becomes fluid. It must therefore be preserved in a covered jar.

The following is the method of application. The paste is spread thickly on a piece of sterile white lint, sufficiently large to cover the whole of the inflamed area. A piece of jaconet is put over the lint to cover it entirely, and cotton wool in abundance over and around the part. The dressing is left unchanged for twelve or twenty-four hours and then renewed. As soon as the slough has separated the ulcer is dressed with the paste until all signs of sphacelating tissue have disappeared and a healthy granulating surface is seen. The cavity is then packed with sterile lint wrung out of a saturated solution of magnesium sulphate, made by dissolving forty ozs. in thirty ozs. of boiling water and ten ozs. of glycerine and sterilizing in an autoclave. The whole area is then covered with a double layer of lint saturated with the solution over which a piece of jaconet and then cotton wool is placed. This dressing is renewed daily until the healthy firm granulation tissue is level with the surrounding skin margin, when it can be covered by a suitable skin graft.

The advantages of this method of treatment are:

- (1) No surgical interference is required.
- (2) Its application is simple and dressing infrequent.
- (3) The combined osmotic action and inhibitory effect on the growth and development of the staphylococcus cleanse the wound and assist in the separation of all sloughing and unhealthy tissue.
- (4) The granulations formed are fine and solid and lend themselves admirably as a base for a superimposed skin graft. W. W. RUDDICK

ANAESTHESIA

Sur un Nouveau Mode d'Anesthésie par voie Intraveineuse En Obstetrique et en Chirurgie.—A New Method of Intravenous Anaesthesia in Obstetrics and Surgery. Perlis, Régine, La Presse Médicale, Aug. 13, 1924, p. 675.

Somniféne is a mixture of diethyl-barbiturate of diethylamine and isopropylallyl barbiturate of diethylamine. It is sold in 5 cc. ampoules. A syringe holding 10 cc. is used and the needle should be a fine one. The injection, from 6 to 9 cc. according to the weight of the patient, is made into a vein at the bend of the elbow. Two or three minutes should be taken to make the injection. Very soon the patient experiences a peculiar taste; vision is affected, objects appearing yellow. The patient quickly becomes drowsy and falls asleep and remains so for three to five hours. The reflexes are not abolished.

In labour the pains are increased in rate and duration. Dilatation of the cervix is hastened. Partial consciousness may be present at the time of delivery and a whiff of chloroform or ether be required. There is no special tendency to haemorrhage or uterine inertia. The patient remains somnolent for from twelve to twenty-four hours afterwards. There are no harmful effects on the child.

In surgical cases it is necessary to give a hypodermic injection of morphine, or morphine and scopolamine, shortly before the somniféne. A little chloroform or ether may be necessary during the operation. The heart, lungs, liver, and kidneys are not affected. The patient can be fed immediately before and after the operation.

W. B. Howell

PAEDIATRICS

The Prognosis of the Sequelae of Epidemic Encephalitis in Children. Kennedy, Roger L.,
M. D., Rochester, Minn., Am. Jour. Dis. of Children, August, 1924.

This paper is a review of fifty-one cases of encephalitis, seen in the Mayo Clinic from 1918 to 1924 suffering from some sequelae of the disease. Of these fifty-one, twenty-nine were boys and twenty-two girls. Age at onset varied from one and one-third to twelve years. As estimated by the parents the children were regarded as having become worse in seven instances, better in eighteen, and apparently stationary in twenty-seven. One child died from an intercurrent infection. Of six children aged three years or under, five are now practically helpless an observation which bears out the observation that sequelae are more severe in the very young.

The sequelae are described under syndromes. The respiratory syndrome consists of periods of abnormal breathing, usually hyperpnoea or forced respiration followed after a moment by breath holding or apnoea. During the periods of forced respiration there is usually some accompanying hyperactivity, jumping out of bed, running about, or twitching of the fingers. Twenty patients, or thirty per cent, exhibited this syndrome and of these seventeen had other severe sequelae. The severity of this syndrome is apparently limited and tends to remain stationary or improve.

Twenty-one cases presented juvenile paralysis agitans or the Parkinsonian syndrome with typical attitude, facial expression, tremor, and physical weakness, but normal mentality. The outlook in this condition is bad, though the immediate danger to life is not great. It is generally accepted that there are destructive lesions of some sort in the basal ganglia. With the lack of repair characteristic of brain tissue, improvement is not to be expected.

Disturbance of sleep and nocturnal hyperkinesis is one of the most common and most troublesome sequelae of the disease. Night may be turned into day to the accompaniment

of shouting, singing, whistling, etc., sedative treatment being of no avail. The inversion of the time of sleep, a decrease of the total sleeping time, and nocturnal hyperactivity are the chief features. Of nineteen patients presenting this syndrome seven have failed to improve and of all the groups these seem to have the least permanent impairment, when no other syndrome is present.

Another group suffered from changes in personality and behaviour. Every conceivable act, occasional or habitual, and all the different psychic and emotional states are displayed by these patients. They are apparently acting in response to a most urgent stimulus which they are powerless to resist. However, they are moral rather than mental imbeciles, as the mental facilities are rarely greatly impaired. Of twenty-three such children six improved and seventeen showed no improvement or had become worse. These syndromes may appear singly or in combination in any one patient, one or other gradually becoming predominant.

Of the six children under the age of four, one is well, five are mentally deficient. Fortunately only few young children were attacked.

A number of very interesting reports of cases exemplifying the various syndromes are included.

R. R. S.

The Effect of Fluid on the Temperature and Blood Concentration in the New-Born With Fever. Bakwin, H., Morris, R. N. and J. D. Southworth, J. D., Am. Jour. Dis. of Children, June, 1924.

Serum protein estimations and red blood cell counts were done on a number of new-born infants with fever and on older infants with fever due to some infection.

Fluids were administered by gavage, intraperitoneally, and hypodermically, in amounts equalling 30 to 40 cc. per kilogram of body weight, and the estimations repeated at frequent intervals thereafter, to find if possible which route of administration was the most efficacious in relieving the dehydration.

Their results show that water or five per cent glucose solution given by gavage or nasal drip are the most efficacious, producing quickly a fall in temperature to normal, a diminution of the serum protein concentration, and a fall in red blood cell count.

Saline solution by mouth, intraperitoneally, or by hypodermoclysis was not as efficacious in reducing the temperature, etc. Solutions of glucose by mouth stronger than five per cent produced diarrhoea in the new born.

In infants with fever due to infection, water gavage did not reduce the temperature nor did it lower the concentration of the serum protein: that is, the rise of temperature in the new-born is not due to infection, but is due to loss of water. This loss of water can most rapidly be replaced by giving plain water by mouth or gavage, rather than saline solution hypodermically or intraperitoneally.

R. R. S.

PSYCHIATRY

Affective Disorders Following Acute Epidemic Encephalitis in Children. Rhein, J. W. and Ebaugh, F. A., Am. Jour. of Psychiatry, April, 1924.

The authors' observations were made on seven children in the neuro-psychiatric clinic of the Philadelphia General Hospital. Their ages ranged from eight to fourteen years. In some cases the psychic disorders came on soon after the attack of encephalitis; in other cases after an interval varying from a few months to two years.

Three of these children had attempted suicide. The attempts were made mostly at night, and appeared to be related to states of agitated insomnia so common in these cases. In two other cases threats of suicide had been made. One patient had attempted to kill his brothers and sisters with a knife. The authors draw attention to the absence of motivation in the suicidal attempts. One boy tried to choke himself while in the ward, and on being questioned as to his motive admitted that he had no desire to kill himself and was unable to give any reason for his act. They also note in their cases the absence of inhibition of thought and of ideas of self-reproach which characterize manie-depressive types of psychosis. The affective disorders of children and adults followowing epidemic encephalitis are not confined to the depressed type. They may be related to the personality make-up of the patient and present

the aspect of depression, anxiety state, elation, hysteria, or paranoid state.

The conduct disorders described are remarkable. In one patient, a boy aged ten years, there was a total change in character and disposition. He frequently disgraced his family by begging in the street. He became incorrigible in school and developed hysterical tendencies. In the case of a boy aged eight, his previous incorrigibility had been increased by his illness. He frequently walked the streets at all hours of the day and night. He stole and had screaming spells. He developed a tendency to cruelty and marked sexual precocity.

In this connection it is of importance to realize that the mental complications of epidemic encephalitis cause behaviour disorders of medico-legal importance, consisting of delinquent acts and suicidal attempts.

A. G. MORPHY

The Practitioner and the Diagnosis of General Paresis. Brush, N. H., Am. Jour. Psychiatry, April, 1924.

In this very practical paper Dr. Brush reminds us that while in many cases paresis is easily diagnosed, in other cases the diagnosis is difficult, and the symptoms may be ascribed to overwork or neurasthenia which are really due to an unsuspected development of general paresis.

Just as visceral syphilis is a protean disorder and can simulate any known disease, so paresis can simulate any known mental disorder. The earliest symptoms of paresis also may be entirely somatic and have no reference to the central nervous system. Their multiplicity is apt to throw the physician off his guard and make him think he is dealing with a neurotic or neurasthenic individual. The absence of a number of the "standard" symptoms must not mislead us, such as Argyll Robertson pupils, increased deep reflexes, tremor of the hands, tongue and lips, disordered speech and writing, and ataxia of the extremities. Their absence does not indicate that the patient is not a paretic. A sluggishness in the reaction of the pupils to light, or a slight inequality should immediately stimulate suspicion. Tremor of the hands may escape notice or be ascribed to some other condition. Increase in the deep reflexes may be put down to psychoneurosis. Speech and writing tests, not being part of the routine of the physician's examination are apt to be omitted, and abnormalities of either may pass undetected.

Paresis should always be borne in mind as a possible cause of convulsive seizures in adults. Information from the patient's relatives with regard to any change in character or deterioration in the personality associated with increased irritability, defective judgment, or failure in memory, is of primary importance.

The practitioner should not rely on physical findings only, but should investigate the mental states. No examination is complete without an examination of blood and spinal fluid.

A. G. MORPHY

Socio-Psychiatric Delinquency Studies. From the psychopathic clinic of the Recorder's Court, Detroit. Raphael, Theodore, Jacoby, A. L., Harrigman, W. W. and Raphael, Mary M., Mental Hygiene, April, 1924.

The Recorder's Court in Detroit represents the municipal Criminal Court, with seven presiding judges, and jurisdiction over all adult criminal offences, major and minor. The psychiatric clinic in connection with this court was organized by Dr. A. L. Jacoby in 1921. The cases on which the present study was made were selected as cases which had been well worked up from medical, psychiatric, social, legal, and racial standpoints, and were bonafide court cases, i.e., were not referred to the clinic from other agencies. The total number was 1988, and included 1509 males and 479 females; 231 of the total number were negroes. Thus percentage of males and females were 75.9 and 24.1 respectively; a ratio of 7.5 to 2.4, contrasting with 3.6 to 2.7 of the general population. As regards age the highest percentages were between twenty-one and thirty years and thirty-one and forty years. As to race the incidence of crime among foreign born, and the native born of foreign parentage was comparatively low.

In fourteen per cent of the cases, a definite neuro-psychiatric family history was made out, and in twenty per cent a history of tuberculosis, alcoholism, and syphilis in the immediate ancestry. In 41.7 per cent of all the cases the family situation was distinctly unfavourable owing to poverty, disease, dissoluteness, disagreement, desertion or divorce, lack of training, and unemployment. Divorce had occurred in twenty per cent of the females and in 10.3 per cent of the males.

As regards the physical status the general health was found below average in only 8 per cent. A venereal incidence of 21 per cent was returned, with 8.8 per cent of syphilis. Among the negroes these percentages were 35 and 21.7 respectively. As regards general personality, reaction, and habits, some definite abnormality was found in 67.7 per cent of the total, as manifested by mental instability, irresponsibility, inadequacy, alcoholism, drug addiction, social looseness, and other vices. As to occupation the labour group comprised 48.6 per cent of the total. As regards education 10 per cent had none; 31 per cent were below the fifth school grade; 44 per cent were between the fifth and eighth school grade; 13.6 attended high school; 1.3 per cent had attended a college course. As other observers in the same field have found, the offender is found to be definitely handicapped; mired, as it were, in the slough of mental defect, degradation, and maladjustment.

The writers classify offences under four headings, with percentages as follows: acquisitiveness 32.6; pugnacity 23.8; sex 13.6; negligence 30.

The figures with regard to intelligence levels are as follows: superior (mental age fifteen years or over) 8.3 per cent, average (mental age eleven to fifteen years) 39.5 per cent, inferior (mental age eight to eleven years) 33.4 per cent, feeble minded (mental age under eight years) 18.8 per cent.

The combined inferior feeble minded group therefore comprised 52.2 per cent of the whole; among the negroes 74.9 per cent. The known and fairly valid estimates of feeble mindedness in the general population varying from 0.2 to 2 per cent form a striking contrast to the figures above. Moreover the percentage of mental superiors in the group is very small. In the matter of psychiatric status a total deviation of 77 per cent was determined; 14.8 per cent being actually psychotic or insane. In this group the following percentages are conspicuous; dementia praecox 5.4. per cent, constitutional psychopathic inferiority 36.8 per cent; alcoholic deterioration 11.3 per cent;

manie-depressive psychoses 1.7 per cent; undiagnosed 9.7 per cent.

In the summary of their investigations the writers draw attention to the high rate of psychiatric and intellectual deviation, and the high incidence of recidivism. They contend that on the basis of the medico-social criteria analyzed in their cases, "crime is not a specific legal, psychiatric, or social entity, static and inorganic, but rather a reaction of manifestation, dynamic and vital in the social mass, representing a pattern-shift in the kaleidoscope of individual and social handicaps, and maladjustments, and clearly demonstrating that our remedial endeavours must be conceived and directed from this point of view."

A. G. MORPHY

GYNAECOLOGY AND OBSTETRICS

Rupture of Uterus. Hillis, D. S., Surgery, Gynaecology and Obstetrics, July, 1924.

The author reports four cases of rupture of the uterus. All occurred during the last three months of pregnancy and in each the rupture occupied the site of a previous Caesarian section scar. Two of the cases had fever following the Caesarian operation section, the other two were afebrile.

The location of the placenta over the sear seemed to have no influence on the rupture since in two of the cases there was no sign of placental tissue in this region. Trauma played no part with the possible exception of one case. In all the cases the uterus had emptied its contents into the abdominal cavity; it was well contracted and retracted with no bleeding at the time of laparotomy. External bleeding was not present in any of the cases because labour had not begun and the cervix was closed.

Hysterectomy was performed in all the cases on account of the danger of a second rupture in a subsequent pregnancy and on account of the time required to freshen the scar edges if a repair had been attempted.

IVAN PATRICK

End Results of a New "Uterine Shelf" Operation for the Relief of Cystocele. Smith, Herbert L., Surgery, Gynaecology and Obstetrics, July, 1924.

The operation was first described by the author in a paper presented in Boston in 1916. Its essential feature consists of the fixation by

sutures of the cervix to the base of the triangular ligament, after the mucous membrane of the anterior vaginal wall has been denuded.

The report is based on the end results of forty cases as shown by written communications from the patient or by personal observation. All the cases were beyond the child-bearing age.

The author forms the following conclusions: The operation is safe and the bladder is permanently retained in its corrected position. The symptoms are completely relieved in at least ninety-five per cent of the cases. The best results are obtained when the uterus is supported by some intra-abdominal operation. A large measure of relief can be expected where an intra-abdominal operation is contraindicated. It is essential that any relaxed and torn perineum or rectocele should be repaired.

Carcinoma of the Uterus. Crile, G. W., Am. Jour. Obstetrics and Gynaecology, May, 1924.

These are preliminary studies of carcinoma of the uterus, in a series of 357 cases; of these 251 were carcinoma of the cervix, 106 were carcinoma of the fundus. In this series the age of greatest incidence was high, being between fifty and sixty years, the findings of most of those reporting such cases being forty to forty-five years. Those cases considered to be operable where the disease affected the cervix were 27.3%, where the disease affected the fundus 76.9%. He considers lacerations, myomata, endocervicitis and endometritis to be predisposing causes.

His conclusions are as follows:

- 1. Any abnormality of uterine function during the child-bearing period must be most carefully investigated to determine the cause.
- 2. Any abnormal discharge after the menopause indicates a vaginal hysterectomy followed by radium.
- Radium and deep x-ray in all cases of carcinoma of cervix, final judgment as to abandonment of surgery in these cases being reserved.
- 4. Individualization of each patient; that is, certain cases of carcinoma of the fundus, which are apparently inoperable, may become operable after a period of rest and the application of selected therapeutic measures. IVAN PATRICK

DERMATOLOGY

Phenolphthalein Eruption. Netherton, E. W., Med. Jour. and Record, June 4, 1924.

Cases of eruption due to the taking of phenolphthalein are not common, even in the proceedings of dermatological societies, but the writer thinks that such eruptions probably occur more often than is generally supposed, only they are not recognized. The first case on record is that reported by Abramowitz, in 1918, in which the source of the drug was ex-lax, and since then several more have been described. The writer reports a case in which he definitely proved that the taking of ex-lax tablets or phenolphthalein in any form, was responsible for a severe generalized eruption. The clinical picture of this eruption is so uniform that it seems safe to consider the condi-

tion a distinct type of dermatitis. As in the author's case, it consists of numerous scattered somewhat grouped, irregular, polychromatic, macular plaques, varying in size from a pinhead to a coin, or the palm of the hand. The colour varies from pink to deep purple. With exacerbation the plaques may enlarge peripherally and become confluent. As the attack subsides the affected areas become pigmented and remain so for many weeks. There may be vesiculation, erosion, and superficial ulceration, especially on the mucous membranes of the mouth and the skin of the genitals. There may also be severe itching and burning.

Antipyrin may produce an eruption identical with that seen in these cases, but in the case of this drug the eruption is usually morbilliform, scarlatiniform, or urticarial in character.

H. E. M

Co-operative Plan in Medical Education .-The College of Medical Evangelists, of Loma Linda, Calif., is introducing a plan of co-operative work in the teaching of medicine similar to that which has been carried out in the College of Engineering of the University of Cincinnati. The freshman class for the forthcoming session will be divided into two sections; while one section is engaged in classroom work the other will be engaged in practical work in certain hospitals, laboratories and dispensaries, including work in hydrotherapy, massage and other such tasks for which their knowledge of medicine qualifies them. During the following month the two sections will alternate, the first doing the practical work while the second will carry the regular classroom work. It is planned that eventually this arrangement can be carried throughout a five-year course. The plan has been adopted, first, because the results of the present day medical curriculum are not as satisfactory as desired and, secondly, to make it possible for a student to support himself to a greater extent while engaged in the study of medicine. The experiment will be watched with interest, since it gives promise of restoring to medical students to some extent the benefits derived from the preceptor system of earlier days. The plan is an experiment in medical education, the results of which may help to solve some of the problems connected with it.—Jour. Am. Med. Ass., Sept. 13, 1924.

Prevention of Sterility.-Several points are emphasized by Donald Macomber, Boston. The first is that sterility is a real problem and a big one. Sterility is too important biologically and economically to be neglected. The effects and not the causes have been treated, and the causes will go on producing effects until they are removed. The real problem is not how to deal with sterility, but how to prevent it before it develops. Macomber points out a few of these effects and explains the causes that have produced them. When the causes are known it is as a rule fairly easy to avoid them. What is needed is more knowledge, and this knowledge must be spread by the specialist to the family physician and by him to the There is a growing demand among people of intelligence for more light on these matters, and it is the duty of the medical profession to supply that light and not leave this important field to quacks and charlatans. There are developmental causes, congestive causes, infective causes and constitutional causes.—Jour. Am. Med. Ass., Aug. 30, 1924.

Obituary

- Dr. L. St. Hilaire died recently in Quebec. He was for some time physician at the Goutte De Lait at Quebec.
- Dr. Gustave Couture was drowned in the Gatineau River recently. He was twenty-nine years of age.
- Dr. Christopher Sheppard, a former resident of Toronto, died recently in California.
- Dr. Percy W. Thompson, late of Toronto, a graduate of Toronto University and of Edinburgh, died in July in London, England, where he had been practising for thirty years. Dr. Thompson served through the war with the Imperial forces.
- Dr. A. N. Hotson died at Innerkip village on July the 3rd. He studied at Trinity College Medical School, and after graduation settled in the village of his birth, taking an active part in all the local interests as well as conducting successfully a large practice.
- Dr. J. W. Hart, who had practised in Huntsville for over thirty-five years, died in Toronto on August the 18th, aged sixty-seven years. A busy practitioner, and an interested citizen he was a man of many activities one of which was the building of one of the first hospitals of Northern Ontario.
- Dr. B. E. Hawke, who had practised in Toronto for some years, died in Liverpool early in August. During the war Dr. Hawke served with the R.A.M.C., and was aboard the liner *Laconia* when it was torpedoed. He was in the water a long time before he was rescued, and since then had been in poor health.
- Dr. F. R. Seager, one of the oldest and best known of the practising physicians of western Ontario, died at Brigden, Ontario, on July the 15th. A son of the late Dr. Seager of Port Dover he graduated in medicine from McGill in 1870, and had been in active practice for more than forty years.
- Dr. A. R. Robinson, who had practiced for over fifty years in New York, specializing particularly in diseases of the skin died at Claude early in July in his 79th year. Dr. Robinson was an old graduate of Toronto University. He spent some months at postgraduate work in Vienna, eventually settling in New York, where he became associated with the Polyclinic Hospital.
- Dr. W. H. Brothers died suddenly of angina pectoris while working in his garden at Shoal Lake on Aug. 3. He graduated from the University of Manitoba in 1897 and practiced in Shoal Lake for many years. A quiet and retiring man he was yet a keen student of medicine and was held in high esteem in Northwestern Manitoba. His wife and daughter survive him.
- Dr. R. H. Mullin, who was in charge of the laboratory in the General Hospital and professorial head of the department of bacteriology at the University of British Columbia, died suddenly from cerebral haemorrhage on the morning of August 29th in St. Joseph's Hospital, Victoria, to which city he had gone to attend the meeting of the B. C. Hospital Association.

The doctor was highly regarded in his profession, and was known as a man of very sound judgment. He was deeply interested in all matters in connection with public health, and in the professional training of nurses. He was the author of many important pub-

lications, and was a member of several scientific medical societies. He also took a deep interest in the work of the Board of Trade.

- Dr. T. Newton Greer died at Gores Landing, Rice Lake, on July the 23rd. He had been coroner in chief of Northumberland County for many years, and was the first president of the Central Ontario Medical Association, which is now known as the Peterboro Medical Association. Graduating from Toronto University in 1883, he had been actively at work for over forty years. Dr. Greer filled many important positions in the county, had been an active member of Dominion and Provincial Medical Associations, and of the Ontario Health Officers Association. He also served as Captain in the Canadian Army Medical Corps during the war.
- Dr. Ernest H. S. McLean died on July 18th from heart failure. The citizens of Nakusp and through the Kootenay were shocked to hear of his sudden death. The deceased was apparently in the best of health throughout the day, going his rounds in his usual sunny way, and had attended several public functions during the week. He always took a keen interest in public affairs. He was born near Spencerville, Ont. and was 54 years of age. On graduation he first settled in Calgary in 1891 where he remained a year; then went to Vancouver in 1892 during the smallpox epidemic in that city, and acted as medical officer on the Canadian Pacific Railway trains running between Donald and Revelstoke. Shortly afterwards he settled in Revelstoke and made for himself a lucrative practice, acting at the same time as Canadian Pacific Railway medical officer, and as head of the local hospital. Dr. McLean was a prominent Mason, and had only recently been elected deputy grand master of the Kootenay lodges. He was also a member of the Knights of Pythias, and warden of St. Mark's Anglican Church, Nakusp.
- Dr. Charles Arnold Ritchie of Winnipeg died suddenly on August 11th at White Bear Lake, Minnesota. Dr. and Mrs. Ritchie had left Winnipeg on the 2nd inst. on a motor trip and were visiting friends when the sad event occurred. Dr. Ritchie was born in Annapolis Valley, N. S. and was only an infant when his parents left Nova Scotia and settled in Winnipeg. He was educated in the public schools and afterwards graduated in Arts in 1902 from the University of Manitoba, and the same year entered as a student in medicine at McGill University where he graduated in 1906. After graduation he spent two years in Edinburgh and Glasgow, and also took post-graduate courses at Dublin and Johns Hopkins, Baltimore. After these post-graduate studies he settled in Winnipeg and for a number of years was assistant provincial coroner. He was also past Grand Medical Examiner for the A.O.U.W. A severe attack of influenza in 1915 brought on an attack of auricular fibrillation which obliged him to restrict himself almost entirely to office practice. He is survived by his parents, and his widow, formerly a nurse with the British army. While his illness of recent years kept him from taking an active part in medical affairs he was beloved by those who knew him for his generous open-hearted disposition.
- Dr. A. DeW. Barss died at his home at Wolfville, on the twenty-second of August, at the age of eightytwo. With the exception of Dr. Andrew Cowie, of Halifax, who graduated in 1860, and Dr. Augustus

Robinson, of Annapolis Royal, who graduated in 1863, he was the senior member of the Nova Scotia profession. Dr. Barss graduated in Arts at Acadia in 1859, and in Medicine at Edinburgh in 1864. His professional life was spent at Wolfville, where he long enjoyed the esteem and confidence of a large clientele. He was a foremost citizen of the town, and interested himself actively in every movement which affected its welfare. Acadia University received a large share of his time, and he served his alma mater in various capacities and always with distinction. For some years before his death he was the oldest living graduate of that institution. Throughout his career he was noted for his loyal devotion to every matter to which he gave his support, and his consistent courtesy and charm of personality won for him the affection of a very large circle of friends. Although he retired from active practice some years ago, he continued to maintain an alert interest in everything relating to medical progress. His death is mourned not only by the medical profession but by all who had the good fortune to come in contact with him.

Robert Williamson Lovett, professor of orthopaedic surgery at Harvard University, one of the greatest authorities and most distinguished writers on this branch of surgery, died on July 2nd, at Liverpool. He had sailed for England intending to take a much needed rest, but was taken ashore ill and died four days later in the house of his friend Sir Robert Jones, of septic pericarditis.

He was born at Beverley, Massachusetts, in 1859 and graduated B.A. Harvard in 1881 and M.D. in 1885. After a short time in New York he settled in Boston. He was an original Fellow of the American Orthopaedic Association and was elected an honorary fellow of nearly all the orthopaedic associations abroad. Prof. Lovett was surgeon to the Children's Hospital, Boston, and surgeon-in-chief to the Massachusetts Hospital School for Cripple and Deformed Children. keen and critical in his observations and as Sir Robert Jones has said, "he has enriched the literature of orthopaedic surgery by many classical contributions, and his work on scoliosis and infantile paralysis will have a lasting value." His work on the former subject has passed through several editions. He was joint author in Bradford and Lovett's Orthopaedic Surgery and in 1923 shared with Sir Robert Jones in writing the authoritative work on Orthopaedic Surgery in two volumes

Dr. Lovett will be sadly missed by surgeons of two continents and it may be truly said that at his hospitable house in Boston one might meet with distinguished surgeons from almost any country of Europe. A memorial service was held at the Presbyterian Church, Liverpool, and his body has been conveyed to Boston for burial.

Some Points in the Physiology of Smooth Muscle and its Nerve Regulation.-The observations made by Charles W. Greene and C. D. Bonham, Columbia, Mo., are of significance to the clinical aspect of disturbances in both the alimentary canal and the uterus and its appendages. In circulatory stasis or respiratory inadequacy, in conditions of chronic anaemia, or, in the local conditions of intussusception or strangulation, or other sources by which the oxidation of the tissues is reduced below the normal level of efficiency, it is obvious that profound disturbances in the regulation and activity of the alimentary smooth muscle and of the muscle of the urogenital system may occur. It would seem that the factor of saline balance is of equal importance in the alimentary mechanisms and in the urogenital musculature as in other better known regions of the body. Calcium treatment as recently stressed, involves this alimentary muscle factor. The authors have the impression, from the character in response in experiments, that the effects, both of asphyxiation and of unbalanced salt solutions, on the intestinal segment and the uterus of the rat are largely a response to the influence of these conditions on the intrinsic nerve mechanisms. The chief basis for this belief is the promptness of the onset of the response and of its elimination in the re-

covery stages. This view is strengthened when the preparation is tested against drugs, for example, digitalis, which has scarcely received adequate recognition for its influence on the motility of the alimentary canal. Duodenal segments respond somewhat inconstantly to digitalis. Sometimes the contractions are inhibited as promptly as though extrinsic inhibitory nerves were stimulated. Again, the contraction rhythm is rapidly augmented and the tone is increased. These differences depend on the concentrations of digitalis used on the segment. Weaker doses inhibit, while toxic doses always stimulate the intestine to vigorous contractions. Physostigmin augments the rhythm and amplitude of the segmental contractions of the duodenal preparations, stimulating the parasympathetic and enteric nerve endings. The type of response is quite comparable to that occasionally observed under stronger digitalis. These drugs, especially digitalis, also react on the uterine preparation. The contractions are augmented. The response of the rat's uterus is so prompt and pronounced and characteristic that it would seem to be nerve initiated rather than directly muscular. Even barium chlorid, which has come to be accepted in the literature as a direct stimulator of smooth muscle, belongs in this nerve classification.—Jour. Am. Med. Ass., Sept. 13, 1924.

Medical News from the British Empire GREAT BRITAIN

By the death of Professor Robert Kennedy after an illness of short duration, Glasgow has lost one of her most eminent citizens and Glasgow University one of her most distinguished graduates and teachers. Born in Glasgow, Prof. Kennedy was educated at the Glasgow High School and graduated in 1890 from Glasgow University where his career had been a very distinguished one for he obtained with honours in all branches the degrees of M.A., B.Sc., M.B. and C.M. He was a John Clarke and a George A. Clarke Scholar, and was made a lecturer in Biology at the Glasgow Technical College and university assistant in this department of science. He commenced surgical practice in Glasgow after post-graduate study in Edinburgh and Berlin, and at the early age of twenty-five was appointed to the out-door staff of the Victoria Infirmary. Prof. Kennedy also held appointments at the Western Infirmary and the Lock Hospital, and was assistant to the Professor of Surgery at the University. In 1911, when four new chairs were founded, Kennedy was made St. Mungo Professor of Surgery with awards in the Royal Infirmary. He was a brilliant and instructive teacher and so popular was he that it was no uncommon thing for him to have one hundred and fifty students on his

From his earliest student days Prof. Kennedy was a most assiduous research worker, and in 1899 he gained the degree of D.Sc. with honours. His publications were few, although his investigations were carried out in almost every branch of surgery. He is chiefly known for his work on the seventh and twelfth cranial

nerves.

He was a staunch and true friend and an ever ready help to the young surgeon. Prof. Kennedy belonged to that band of scientific investigators who followed in the footsteps of their great master Lister. He worked strenuously in opposing the demolition of the Lister Ward at the Glasgow Royal Infirmary and journeyed many times to London in this cause. His last days were saddened by the knowledge that his efforts were in vain.

It had been Prof. Kennedy's intention to visit Canada and read a paper before the British Association in

August at Toronto.

We have referred in an earlier issue to the elaborate arrangements made at the Wembley Exhibition for medical assistance to the visiting multitudes. It was realized to the full that exhibition crowds are made up of all classes and all ages from early infancy to extreme old age, and it was therefore necessary to provide for needs between these extremes, and also for incidents peculiar to the environment of a large exhibition. Some of the experiences of the past two months are now available (Brit. Med. Jour., Aug. 9, 1924). The cases dealt with were surprisingly varied in character and severity, which was to be expected in a changing population of between one and three hundred and fifty thousand. The number treated up to the date of the report was over 11,000, amongst the more serious being twelve cases of fracture, dislocations five, perforated duodenal ulcer five, appendicitis four. On one day, also, there were treated eighty-seven cases of gastro-enteritis, but these, it was found, were caused by a certain batch of pies at the exhibition restaurant, and the tracing of the trouble to its source gives a good idea of the excellent system of supervision in the medical arrangements.

People, old and young, frequently fell into the lake, necessitating their being put to bed while their clothes were drying. The batches of ex-soldier paraplegies who were brought to the exhibition required relief of their urinary difficulties; the menagerie at the amusement park provded a few minor injuries incidental to the twisting of the lion's tail and scratches from bears, monkeys, etc. Many elderly people arriving tired after long journeyings showed symptoms of auto-intoxication, and these were given a rest in bed and dieting. Abdominal colic from overfeeding called for anodynes; and the epileptic and hysterical required attention occasionally. The "stunts" of the cowboys and cowgirls provided a few fractured bones, when the portable radiological machine was called into use, with satisfactory results. The provisions for taking care of infants and young children seem to have been excellent. A day nursery of attractive nature was provided for which there was a charge of sixpence for four hours, and a small extra fee for meals; over 5,000 children were admitted to its greatly needed accommodation, in the excellence of which Her Majesty the Queen had shown solicitous interest. These were the more striking features of the medical arrangements, but they are evidence of much hard work and forethought on the part of the St. John Ambulance Brigade and the British Red Cross Society, who provided all the first aid personnel, of whom eighty to one hundred were on duty every day with a full equipment of surgical dressings and drugs.

The following facts are given in the B.M.J. of July 5th, 1924, regarding the price of insulin in Great Britain. "The price of insulin was further reduced on July 1st by Messrs. Burroughs Wellcome and Co., and by the British Drug Houses, Ltd., acting in association with Allen and Hanbury's. Ten average doses (100 units) of which the price a little over a year ago was 25s. and had been since reduced to 4s. and 8d. has now been brought down to 2s. and 8d., about one-third of the present price in America, and the British insulin is at least as good in respect of potency, consistency, and sterility as the American. The British supply is abundant, much beyond their own needs. There are large reserves, and the export trade is helping diabetics in very many countries which are behindhand with their own supplies or have none at all. This highly gratifying state of affairs is to be attributed to the policy pursued from the first under the influence of the Medical Research Council. The manufacturers were encouraged to begin, and were in part protected against underselling from America. They were kept supplied, previous to general publication, with the results of research work as these were obtained, and the Medical Research Council refused to countenance a fixed selling price. Only a maximum selling price was fixed, and it was arranged that this should be reviewed from time to time in the interests of the public. The selling price has, however, continually fallen below the last maximum selling price fixed, and as a result of this competition, the question of the importation of foreign insulin became an academic problem. The results thus obtained may be compared with those reached with regard to neosalvarsan, for which the Board of Trade made a fixed selling price; this was to be a maximum price, but it quickly became the minimum price, with the result that its uncontrolled price in America is, we are informed, about one-tenth of its price here."

AN OLYMPIC WINNER

At the graduation ceremony at Edinburgh, on July 17th, over four hundred degrees were conferred, including 248 Masters of Arts, of whom eighty-two graduated with honours; twenty-three graduands received the recently instituted Bachelorship of Commerce, and ninetythree the degree of Bachelor of Science. An interesting

feature of the ceremony was the graduation (B.Sc. in pure science) of Eric Henry Liddell, who recently won the 400-metre race at the Olympic Games in Paris. His appearance was the signal for a great ovation; after being capped he was presented by the Vice-Chancellor with a Greek ode, which had been composed by the University in his honour, and crowned with a chaplet of wild olive.

INDIA

An editorial in the May number of the Indian Medical Gazette comments on some of the difficulties peculiar to the teaching of medicine in India. No subject, perhaps, in medical circles is discussed with greater variation of opinion, and it is interesting to turn to a country in which the problems are made even more complex by

conditions which do not exist here.

'The curriculum of the medical schools and colleges in India," says the writer, "has become an intolerable burden to the majority of medical students. It is possible that the same thing is happening in the medical schools of England and America, but the students in those countries are probably saved from the worst effects of the evil system by their innate refractoriness and lack of docility...But...the Indian student starts with obvious handicaps; he has to study in a foreign language, and though he has a fairly good literary knowledge of this, it is hard for him to follow lectures which deal with foreign ideas expressed in a foreign tongue. A vicious educational system has made it necessary for him to cultivate the receptive side of his brain rather than the reflective and originative. He comes to his teachers imbued with an intense desire to learn, but ne had already acquired the habit of trusting chiefly to his memory. His mental pictures consist of strings of words rather than of intelligent conceptions. In many cases he has already damaged his physique by overwork in unhygienic surroundings, by lack of exercise and lack of nourishment. He is already the survivor of the fittest when he begins the medical course..... The prospect of the European student when he enters on his medical course is sufficiently appalling, but how much worse is that of the Indian student whose one advantage over his foreign compeer is a higher degree of diligence which is not an unmixed blessing to him? There are two possible means of remedying the evils which have been described. The first is to arrange for a rational course of early education which shall prepare the student for his special life work; this course should develop his reasoning faculties as well as his memory; it should train him in observation and manual dexterity... he should undergo a searching physical examination and if found in any way unfit he should be diverted to some other line of life Having trained and selected the candidates, they should be given a training in medicine which is within the capacity of the average student instead of one which is only suitable for the favoured few. The medical course at the present day is so over-burdened that few even of the best students emerge with a clear conception of what they have been taught, while the average student has confused ideas and is unfitted for his life work.... It is not the student who is now to blame,... it is the taskmasters who through lack of imagination fail to realize the limitations of human en-The entire curriculum should be surveyed durance. afresh and ruthlessly cut down where it is possible to do so, and a course of study should be mapped out which will include only the most essential matters."

H. E. M.

SOUTH AFRICA

The Transvaal Medical Council has issued a letter warning those within its jurisdiction with regard to the practice "which exists on the part of many members of the medical and dental profession, of advertising themselves in many ways, both directly and indirectly, and they state that they are "concerned to note that this practice is very much on the increase." The Council points out that not only has the medical profession always been against advertising in any form, but the feeling against it is also increasing in the dental pro-

fession. Up till now remonstrance and rebuke have been insufficient to check this abuse; the Council therefore makes it known that it will in the future use its powers under the act of erasing the names of offenders from the register. A memorandum is added containing, under several headings, the procedure which a practitioner may adopt in bringing himself before the public, and indicating certain forms of indirect advertising which he may not adopt.

Rews Items GENERAL

The campaign notes of the American Society for the Prevention of Cancer show what a steady effort is being made to combat the scourge of cancer. The Society has a chairman in every state, every province of Canada and the Island possessions of America, and under these are committees and sub-committees, so that there is a very large volunteer administrative organization in operation. The Society has devoted its efforts chiefly to the education of the public in the early signs of cancer, and to the giving of such advice as may lead people to seek competent medical advice as early in the course of their affliction as possible.

The radio has been called into help, and the Society also has a moving picture film entitled "The Reward of Courage" which has been shown to many audiences. The information and advice thus conveyed is termed its "message," which is "delivered" when it is brought to the attention of anyone. By means of the organization referred to, very large numbers of people receive some degree of instruction in modern methods of combatting cancer, and it is stated that reports of chairmen show that in proportion to the population more people are going to physicians for advice and diagnosis than before, and that cases of cancer are being seen earlier.

A small, well-indexed pamphlet, described as "A Guide to Medical Ethics" and issued by the South African Commission of the British Medical Association, 1924, has come to our notice. It contains forty short chapters or paragraphs, which take up the many questions of professional behaviour in an easily readable and understandable form. Those who feel the need of education in the matter of ethics will find in it a ready text-book, but it must also be mentioned that there are many details of distinct importance from the medicolegal, and legal standpoint.

NOVA SCOTIA

As a result of the recent inspection made by Dr. I. D. Metzger, President of the Pennsylvania State Board of Medical Education and Licensure, the Medical School of Dalhousie University has been approved by that Board and Dalhousie graduates will be admitted to the Board's examination for licensure.

On account of the possibility of pollution of the water supply of the town of New Waterford, it has been decided to install a chlorinating plant. The town of Dartmouth has a similar installation under consideration.

The administration building of the Nova Scotia Sanatorium, at Kentville, is being remodelled for the purpose of increasing the accommodation for advanced cases. About twenty-five additional beds will be thus made available for patients of "infirmary" type. While the number of pavilion beds has been ample, there has not been a sufficient number of infirmary beds to meet the demands. The changes now under way will relieve the situation materially. Another building is being adapted to administration purposes.

The two-weeks' course of post-graduate instruction given under the auspices of the Dalhousie Faculty of Medicine was completed September 13th and was most successful in every particular. The attendance was much larger than in previous years, more than eighty physicians from outside the city, including Doctors Archibald and Hicks from British Columbia, being registered. Halifax physicians and hospitals internes swelled the attendance at several of the lectures to nearly 150.

Naturally Nova Scotia contributed the largest number of attendants, but the other maritime provinces and Newfoundland were well represented. The effort was made to make the course thoroughly practical for the general practitioner, and in this the Committee succeeded admirably. The assistance given to the Dalhousie faculty by Sir Henry Gray and Doctors Chipman and Rhea, of Montreal; Dr. Rudolf, of Toronto; Dr. Luther MacKenzie of New York, and Dr. A. F. Miller, of Kentville, was greatly appreciated, and contributed materially to the success of the course. The fact that these men journeyed to Halifax at their own expense, in order that the course might be given free, is a matter deserving the warmest commendation. Twenty-seven members of the Dalhousie faculty took part in the teaching. The mornings were given over to clinics at the hospitals, while the formal lectures were given in the afternoons. In addition to giving three lectures each, Sir Henry Gray and Dr. Chipman conducted operative clinics at the Victoria General Hospital. On the concluding day, Doctors Archibald, of Kamloops, B. C. and Mackinnon, of Antigonish, congratulated the Committee, which, under the chairmanship of Dr. H. K. MacDonald, has arranged the course, and expressed the appreciation of the excellence of the contributions made by the visiting lecturers. A very general wish was expressed that the course be put on a permanent basis.

Dr. Boris Babkin, formerly of the Department of Physiology of the University of Odessa and a pupil of Pawlow's, and for some years past engaged at research work in England, has been appointed Professor of Physiology at Dalhousie University and has taken duty there.

QUEBEC

The annex to the Laval Tuberculosis Hospital, on Ste. Foye Road, Quebee, has been completed and accommodation has been provided for double the number of patients. The Taschereau Camp, which was organized two years ago for the welfare of children threatened with tuberculosis, was opened on July 1st and now has more than a hundred school children under its care and supervision.

A slight change has taken place in the board of directors of St. Mary's Hospital; Dr. J. J. Guerin and C. J. Doherty Esq. have resigned and it will now consist of the following: Dr. F. E. Devlin, Dr. D. A. Hingston, the Rev. G. J. McShane, Rev. Father O'Reilly and Messrs. J. J. Fitzgerald, F. J. Jackman, T. J. O'Neill and T. Taggert Smyth, with three of the Reverend Sisters. The following were chosen as members of the medical board to direct the medical organi-

zation of the institution: Dr. John C. Wickham, Dr. E. J. Mullally, Dr. J. L. L. Mason, Dr. D. A. Hingston and Dr. Dunstan Gray. Patients are now admitted to the hospital and equipment of the most up-to-date character has been installed. The community is under the direction of the Reverend Mother Morrissy.

Dr. A. Marois, formerly assistant superintendent of St. Michael Asylum, Beauport, and a professor at Laval, has been appointed as a medico-legal advisor to the Attorney-General's Department, and thus with Dr. W. Derome of Montreal, the medical staff of this department will be complete. Where formerly his services were retained only in special cases when deemed advisable, he will now hold a permanent position and perform autopsies when necessary, and give his opinion in criminal cases. For some time the government has been engaged in re-organizing the ser-

vices in the Attorney-General's Department in order to bring it up to date, and this appointment of Dr. Marois is a step in this direction.

Through the death of Dr. Robert W. Bell of Toronto, a graduate in medicine of McGill University in 1873, a complete set of photographs of the McGill Medical Faculty of 1870 has come into the possession of the university.

Dr. George Audet has now opened an office in Quebec, where for the past year he has been connected with the Hotel Dieu in that city.

The Medical Society of Chicoutimi-Lac St. Jean held their quarterly meeting recently at Malbaie, at which there was a large attendance of doctors from the surrounding district.

A new course will be given in the third year of medicine at McGill University by Dr. J. W. Bridges, recently appointed professor of psychology and psychiatries. He will lecture upon the psychological principles underlying psychotherapy, mental hygiene and the psychology of insanity. A new step is the appointment of Dr. Jonathan C. Meakins as director of the department of medicine, on a full-time basis. This position corresponds to that of Dr. E. W. Archibald, Director of the Department of Surgery. Both these directors will have full charge of the teaching in the university and hospitals in their respective subjects.

Dr. George R. Brow, a graduate in 1920 of McGill University has been awarded the Rockefeller Travelling Scholarship in Medicine of the value of \$1,500. Dr. Brow, who is a native of Prince Edward Island will sail for England this year and devote special study to diseases of the heart under Sir Thomas Lewis.

Dr. A. Grant Fleming assistant city officer of Public Health in Toronto, has resigned to take an important position in Montreal. Dr. Fleming has been in that city's employ for 16 years; originally he was given charge of the civic laboratories and more recently charge of the medical services including that of the inspection of schools in which services he attained a high reputation for efficiency. In Montreal, Dr. Fleming will work under the Anti-tuberculosis Association in disease prevention work. Lord Atholstan, who is a member of the Association, contributed \$100,000 to the work.

Premier Taschereau speaking at the official opening of the Congress of Physicians speaking the French language declared that the Government of Quebec is prepared to extend generous aid to all medical undertakings deemed necessary for the public welfare. During the course of the last three years, he stated, \$3,000,000 had been granted to hospitals, and \$100,000 had been donated to the University of Montreal to create a radium institute. In addition to this \$500,000 had been given to combat tuberculosis by increasing the number of dispensaries in the province, and to further the efforts of physicians generally in improving health conditions in the province of Quebec.

At the Congress of medical men of North America speaking the French language, held in Quebec, the problem of tuberculosis received full discussion and much attention was given to the prevention of the discusse among children. Dr. Sergent, Dr. Bordet and Dr. Ribadeau-Dumas, three of the delegates from France are especially interested in the fight against tuberculosis and they discussed the question at length. The Congress was well attended. At the end of a banquet tendered to the delegates Abbe Camille Roy conferred the honorary degree of Doctor of Medicine on rour of the French delegates to the convention. Professors Sergent, Jeanneney, Ribadeau-Dumas and Desmarees. Professor Sergent thanked the University in the name of his college.

Many universities, including the university of New Zealand, will send representatives to the official opening of the new Pathological Institute of McGill University, which will take place on Founder's Day, October 6th, at 4 p.m. The ceremonies of the day will be prolonged into the evening when the Convocation will be held and Founder's Day address delivered. A reception in honour of the many distinguished guests attending the opening will close the proceedings.

The formal opening of the magnificent new Notre Dame Hospital on Sherbrooke Street East marks an outstanding milestone in the history of an institution known for its good work. It is also an occasion for congratulating the City of Montreal upon a notable addition to its institutions for promoting the health and welfare of its citizens. Visitors in large numbers have inspected the new extension to the hospital which is situated on Sherbrooke Street East just west of Papineau Avenue.

ONTARIO

ST. LUKE'S DAY SERVICE

The First Annual St. Luke's Day Service of the Academy of Medicine, Toronto, will be held in Convocation Hall on Sunday, October 19th, 1924, at 4 p.m. The musical portion of the service will be under the direction of Dr. Healey Willan of the University Faculty of Music, assisted by the choir of the Church of St. Mary Magdalene (by kind consent of the Vicar). The sermon will be preached by Reverend Canon C. A. Seager, D.D., Provost of Trinity College. A cordial invitation is extended not only to Fellows of the Academy and their wives, but to all other medical graduates, medical students and nurses. Seats on the ground floor will be reserved for Fellows.

For the fourth time in its history the annual meeting of the British Association for the Advancement of Science was held in Canada. Under the presidency of

the physician, Sir David Bruce, the Association met in Toronto from August 6th to 13th. Papers on subjects in almost all the branches of science were read in the various sections of the Association and of course those in the sections of psychology, zoology, anatomy, physiology, and sociology were the most interesting to the medical profession. Dr. H. H. Dale, F.R.S. delivered the presidential address before the physiological section upon "Progress and Prospects in Chemotherapy." Prof. W. B. Cannon's paper upon "The Rôle of Adrenal Secretion" provoked much discussion. Very instructive demonstrations in cardiology, the mechanism of the digestive tract, and in physiological chemistry were given. Prof. Bazett of the University of Pennsylvania, read a most interesting paper upon "Experimental Aortic Regurgitation in Animals." Before the various sections popular lectures were delivered and were much appreciated by the general public.

MANITOBA

Another of those international gatherings which tend to promote good fellowship as well as the diffusion of scientific knowledge was the meeting of the Mid-West Section of the American College of Surgeons held in the Fort Garry Hotel, Winnipeg, On September 2 and 3. Operative clinics were held at the General, Misericordia and St. Boniface Hospitals from 8 to 10 each morning and these were followed by clinical addresses. The programme was as follows:

Sept. 2 .- The Treatment of Chronic Empyema-with lantern slides. Dr. Carl A. Hedblom, Professor of Surgery University of Wisconsin Medical School, Surgeonin-Chief of the Wisconsin General Hospital, Madison.

Gastro-duodenal ulcer—Dr. Robert C. Coffey, Portland,
Oregon, Chief Surgeon Portland Surgical Hospital.

Luncheon with address by Rev. Father Morton, B.Sc.

Afternoon.—Joint meeting with Manitoba Hospital
Association. Speakers: Dr. M. T. MacEachern, Chicago, Dr. A. D. Craig, Chicago, Mr. J. S. Hough, K.C., Winnipeg, Dr. M. M. Seymour, Regina Deputy Minister of Public Health, Province of Saskatchewan and Drs. William Chestnut, W. Harvey Smith and O. Bjornson,

Evening.—Public Community Health Meeting. Chairman: Dr. Jas, McKenty. Speakers: Dr. M. T. MacEachern, Chicago, Dr. S. Willis Prowse, Winnipeg, Dr. Carl A. Hedblom, Madison, Wisconsin, Dr. R. C.

Coffey, Oregon, Dr. Allan Craig, Chicago. Sept. 3.—Applications of the Protective Quarantine Pack in Abdominal Surgery-Dr. R. C. Coffey. The Diagnosis and Treatment of Diaphragmatic Hernia-Dr. C. A. Hedblom. Luncheon with address by Rev. Dr. E. Leslie Pidgeon. The Differential Diagnosis and Treatment of Non-Tuberculous Pulmonary Suppuration-C. A. Hedblom. Perforations of the Stomach and Duodenum-Dr. A. W. Ide, St. Paul, Minn. Chief Surgeon Northern Pacific Railway, Eastern Division. Principles Governing Treatment of Surgical Conditions of the Large Bowel-Dr. R. C. Coffey.

In the evening an enjoyable banquet was held in the Fort Garry Hotel at which the chief speakers were Dr. Hedblom and Dr. Falconer of Dunedin, New Zealand.

At the regular luncheon of the staff of the Winnipeg General Hospital on Aug. 21, medical members of the visiting British Association were the guests of the staff: Dr. E. P. Cathcart, Gardiner Professor of Chemical Physiology, Glasgow University and Dean of the Glasgow Universit gow Medical School, Dr. Ivy MacKenzie of the Victoria Infirmary, Glasgow, neurological specialist to the Minister

of Pensions, and Dr. J. A. H. Burn of the National Institute of Medical Research, London.

Dr. Cathcart, Dean of the University of Glasgow in a short address said that the modern tendency was to place too much stress on laboratory methods. In his opinion the principal thing needed in diagnosis was experience. What was needed was to place more reliance in the old time method of practice, which was based chiefly upon experience. This was not a reversion, but rather a step forward. We do not know what basal metabolism means; we do not know why divergence takes place. The more simple the method the better the result. Again, we do not live on calories; food does not depend upon its calory content; the term calory is only a unit a convenient term to use in speaking. The vitamin is an unknown factor; the theory does not present the whole of the facts.

The speaker was asked how to prevent students from being overwhelmed by the glamour of the laboratory. The Dean thought that this was the crux of the whole question. He suggested that the remedy lay in intro-ducing clinical material at an earlier date. The student must be trained to rely upon his own observations.

Dr. Ivy McKenzie, chief of the staff in medicine at the Victoria Infirmary, Glasgow, and lecturer in medicine at the University of Glasgow, supported the views of the Dean. He had spent some years in the laboratory and was to some extent able to assess the value of the methods. We cannot afford to get away from anatomy and physiology. He thought it was the function of the teacher to stand between the student and the danger of overvaluing laboratory methods. One could not diagnose by looking over reports of cases. He agreed with Dean Cathcart in what he had said regarding basic metabolism.

Dr. Burn, of London, gave some particulars of the work of the National Institute for Medical Research. This Institute had done a good deal in assisting the manufacturers to place insulin on the market. Dr. Allen from south of the border spoke in favour of the intercommunication of groups; he thought this made for the avoidance of misunderstandings and the promotion of good fellowship throughout the prefession.

Among other guests present were Dr. Allan of Johns Hopkins Hospital, Baltimore; Dr. Girdleston, of River-

side, California, and Dr. Corkhill of Edinburgh.
Dr. W. S. Peters, President of the Brandon and
District Medical Association and Councillor of the M.M.A. executive has sold his practice to Dr. D. J. Fraser of Winnipeg. Dr. Peters is taking post-graduate work at the University of Pennsylvania.

SASKATCHEWAN

ANNUAL MEETING SASKATCHEWAN MEDICAL ASSOCIATION

The Seventeenth Annual Meeting of the Saskatchewan Medical Association was held at Moose Jaw, July 8th and 9th, with a record attendance. The programme submitted, was very excellent, owing to the fact that the Provinces of Manitoba, Saskatchewan, Alberta and British Columbia acted in conjunction with each other with the assistance of the Canadian Medical Association.

The Western Provinces owe a debt of gratitude to Dr. J. F. Kidd of Ottawa, Ex-President of the Canadian Medical Association, and Dr. T. C. Routley of Toronto, General Secretary, who met the western representatives at Winnipeg and completed the arrangements for the programmes of the Western Associations.

The Association considers itself extremely fortunate in being able to secure a representative of the ablest practitioners in Great Britain, as well as several of the leaders of the profession in Canada.

The programme was as follows: Tuesday, July 8th, 1924.—Address of Welcome: His Worship Mayor Davidson of Moose Jaw. "The Work in Canada: "Dr. R. E. Wodehouse, Secretary, Canadian Tuberculosis Association. "Tuberculosis:" D. A. Stewart, B.A., M.D., Medical Superintendent Manitoba Sanitorium, Ninette, Man.

Luncheon. Address: D. A. Stewart, B.A., M.D.
Afternoon Session.—"Bacillus Coli Infection of the
Urinary Tract:" Sir John Thomson-Walker, O.B.E.,
C.M., M.R.C.S., F.R.C.S. (Eng.), Senior Urologist and
Lecturer, King's College Hospital. "The Right Iliac

Fossa: '' Dr. Frederick N. G. Starr, C.B., F.A.C.S., Associate Professor of Clinical Surgery, University of Toronto. Dr. T. C. Routley, General Secretary, Canadian Medical Association.

BUSINESS MEETING

Wednesday, July 9th, 1924.—Morning Session. "Symptomatology and Diagnosis of Pelvic Conditions:" Dr. F. W. Marlow, Associate Professor of Gynaecology, University of Toronto. "Physical Examination of a Patient:" Dr. George S. Young, Associate Professor in Medicine, University of Toronto. "Pathology, Diagnosis and Treatment of Gall Stones:" Dr. Lorimer J. Austin, M.A., F.R.C.S. (Eng.), F.A.C.S., Professor of Clinical Surgery, Queen's University.

Surgery, Queen's University.

Wednesday, July 9th, 1924.—Afternoon Session. Management and Treatment of Pelvic Conditions: '' Dr. F.

W. Marlow, Associate Professor in Gynaecology, University of Toronto. 'Psychotherapy from the standpoint of the General Practitioner:' Dr. George S. Young, Associate Professor in Medicine, University of Toronto. 'Diseases of the Rectum:' Dr. L. J. Austin, Professor of Surgery, Queen's University. Public Meeting, Wednesday, July 9th, 8 p.m. addressed by four visiting speakers. A very hearty and sincere vote of thanks was tendered each of the speakers.

The programme of entertainment, given by the medical men of Moose Jaw was an excellent one, and very much appreciated by those in attendance.

The following officers were elected for the year 1924-1925: Hon. President, Dr. T. M. Leask, Moose Jaw; President, Dr. T. W. Walker, Saskatoon; 1st Vice.-Pres., Dr. W. A. Harvie, Regina; 2nd Vice-Pres., Dr. R. B. Stirrett, Swift Current; Gen. Sec. Treas., Dr. A. MacG. Young, Saskatoon; Hon. Members, Dr. J. F. Kidd, Ottawa; Dr. T. C. Routley, Toronto.

Executive Committée: Dr. S. E. Moore, Regina; Dr. R. H. MacDonald, Saskatoon; Dr. J. E. Bromley, Estevan.

Representatives to C.M.A. Council: Dr. T. W. Walker, Saskatoon, (President S.M.A.) Dr. A. MacG. Young, Saskatoon, (Gen. Sec.-Treas.) Dr. D. P. Miller, Prince Albert. Dr. T. A. Patrick, Yorkton. Dr. T. A. Morrison, Regina. Dr. T. M. Leask, Moose Jaw. Dr. A. W. Knox, Weyburn.

Editorial Board: Dr. R. G. Ferguson, Fort Qu'-Appelle. Dr. D. S. Johnstone, Regina. Dr. R. R. Stirrett, Swift Current.

Publicity Committee: Dr. A. MacG. Young, Sask-atoon.

BRITISH COLUMBIA

Dr. Walter Graham has relinquished practice at Michel and returned to Vancouver.

Dr. R. deL. Harwood has been invited to Kamloops to address a meeting of returned soldiers' organizations in that city.

Dr. W. S. Turnbull, having recovered from his recent illness, is contemplating an extensive post-graduate course in eastern centres.

Dr. H. H. Milburn, President of the Vancouver Medical Association has been called east owing to the serious illness of his father.

Dr. Sievenpiper is taking charge of the practice of Dr. J. R. Davies, who contemplates a long absence from the city on post-graduate work in paediatrics.

Dr. McCullough, late of the interne staff of the Vancouver General Hospital, is now acting as assistant to Dr. W. A. Moffatt, vice Dr. Ewart, who has taken up practice at Terrace on the Skeena River.

Arrangements for the coming session of the Vancouver Medical Association are now in active progress and an excellent programme for the year is being compiled. Among those who will address the Association during the winter will be Dr. R. C. Coffey, of Portland, Ore., and Dr. C. E. Hagyard, of Seattle. The great necessity now for the Association is proper accommodation of its own as suitable rooms for holding meetings are becoming increasingly difficult to obtain.

A memorial service for the late Dr. R. H. Mullin was held at St. Andrew's Caurch on Sunday, Sept. 7th, which was largely attended by members of the medical profession and the various faculties of the University, as well as by representatives of the numerous organizations with which the late Dr. Mullin was associated. His activities touched the community life at many points, and his sudden and untimely death leaves a vacancy which will be hard to fill.

The Annual Meeting of the Prince Rupert and District Medical Society (No. 7 Branch of the B. C. Medical Association) was held in Prince Rupert on August 29th. Dr. C. H. Vrooman, President of the B. C. Medical Association, Dr. J. M. Pearson, and Mr. C. J. Fletcher, Executive Secretary of the Association, attended the meeting from Vancouver. After dinner at the St. Regis Cafe with Dr. H. E. Tremayne, President of the District Medical Society in the chair, clinical papers were read by Dr. Vrooman and Dr. Pearson. In attendance were all the doctors of Prince Rupert, as well as Dr. A. E. H. Bennett, of Ocean Falls; Dr. W. Sager, of Pt. Simpson, and Dr. E. W. Ewart, of Terrace.

Two Cases of Amyotonia Congenita Occurring in the Same Family.—The two cases reported by Gerald R. Allaben, Rockford, Ill., are of interest owing to the fact that heredity, or a familial tendency has not been noted in

the cases heretofore reported. These cases, and possibly a third, all occurred in male children in the same family, whereas, two female children in the same family showed no signs of the disease.—Jour. Am. Med. Ass., Sep. 13, 1924.

Investments

WHEN MONEY GOES TO WORK

It is unfortunate that the investor cannot always see his dollars at work. When he cashes a coupon or a dividend cheque he knows that the money he has saved is busy at work for him. But he cannot always see the numerous sources of wealth that his money creates.

At one spot in Canada that was almost untracked woodland a couple of years ago, 1,400 men are at work putting in a power dam and power house. Fourteen hundred jobs have been created for fourteen hundred men because investors have invested their capital in a new waterpower development company. But that is only the start. Machinery is bought—millions of dollars worth of it—and workers in electrical equipment plants in Canada are given employment to build the machinery. Further back along the line, steel plants speed up; cement plants work an extra hour a day; young engineers just out of college find a use for their training and an outlet for their energy.

At another site, on the Ottawa River, several carloads a day of lumber, cement, foodstuffs, machinery and other goods are being brought in to speed up construction work on the Ottawa River Power Company's development. Brains and brawn are finding both wealth and happiness for many Canadians and finding them where there has been only the impressive but lazy solitude of trees and the meaningless rush of waters.

Somewhere else a paper mill is going up and the dollars of investors find their way to a million pockets. A contractor gets a building job and posts up a "Help Wanted" sign. Half a dozen machinery factories get orders and give the employment manager a job to do. Prosperity spreads itself in a thin blanket over the whole country.

By and by the power dam will be completed; the penstocks will be ready to guide the waters to turbines keyed to the utmost in efficiency. The soapstones will be ready to grind the ragged logs; the felt blankets will be stretched to carry their thin sheet of paper to the rolls that will carry it to the printing press for a brief but forceful life. All that will mean the actuality of permanent employment for new Canadian citizens; it will mean the civilizing force of many new homes, new stores, new schools and new churches and more of each as new industries follow on. The invested capital, if it has been well invested, creates new wealth. In this new wealth the investor shares generously and satisfyingly.

A recent investigation brought out the fact that for every two men working in power plants there are 98 men working in factories, etc., that have been built to utilize the power. The same investigation brought out the equally significant fact that in the area surveyed every 1,000 H.P. developed represented an investment in power plant of about \$250,000. Yet there was invested in enterprises and activities for the use of the power more than \$1.600.000 for each 1.000 horse power.

terprises and activities for the use of the power more than \$1,600,000 for each 1,000 horse power.

The development of power is the real key to all industrial development. This is particularly true of Canadian water-power development. A visitor to the plant of the Shawinigan Water and Power Company would find scarcely half a dozen men at work at any one time. Yet this plant sends out the motive force that turns wheels in hundreds of factories and dozens of communities and makes possible the employment of thousands of men. Another power plant that will develop a third of a million horse power will be operated day and night by a force of twelve men. One cannot measure the extent of the wealth and prosperity to be created by this power plant.

Canada has a direct revenue of \$85,000,000 a year from water-power development. But this figure is as nothing compared to the vastly greater additions to the country's wealth that come each year from the utilization of the power that in itself represents this comparatively large sum.

The greatest satisfaction comes to the investor who puts his money to the most productive use just as the most happiness comes to the man who turns his energies to the most creative work. The financial rewards for those who invest their money in the sane and careful exploitation of the nation's wealth of natural resources have been as satisfying as the less tangible rewards in the mental retrospect of an effective accomplishment.

When you buy a security, try to look through the engraved scrip to see the truth of the romance behind the investment. The picture of life and activity, of new wealth and prosperity, that you will see resulting from your own thrift and the judicious use of your "five talents" ought to give you a consciousness of the part you are playing in the building up of Canada. It will make you realize that your thrift gives Canada the capital that is essential to progress.

There are practically no industries, railways, power plants or other enterprises in Canada that are owned by one man or even by one family. Thousands of investors; large and small, have contributed the capital to build these institutions and they control and run them. The investment of capital is an interesting phase of national development in which every man and woman can share to some degree.

Members are invited to write to the General-Secretary, Dr. T. C. Routley, 184 College St., Toronto, for information or advice regarding investments.

Inquiries will be entirely confidential, and answers will be based upon information believed to be reliable, fair and unprejudiced.

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"Organotherapy must be Pluriglandular" See November issue of the Medical Association Journal, page 859

J. I. EDDÉ New Birks Bldg., Montreal

Book Reviews

The Journal of the Association of Medical Women in India, 1924, xii (May).Printed for private circulation. Subscription to the Association Rs. 5; for the Journal Rs. 4.

We have just received a copy of this journal a reading of which we recommend to all who are interested in the work of medical women. The Association of Medical Women in India was founded seven years ago and has evidently proved a great success in bringing members of the profession together. Annual meetings are held, this year in February at Delhi. Some of the papers read at that meeting are published in this number. One of the best of these is by Dr. E. M. Farrer and deals with a recent epidemic of dengue fever in the Punjab, and two short papers are by Dr. E. MacMaster who is in charge of the Canadian Presbyterian Mission Hospital at Indore. The other papers for the most part are concerned with gynaecological or obstetrical problems and those of child wel-How important is the work of women doctors in India may be learnt from a few facts contained in the annual report of the Dufferin Fund. In 1922 there were 436 women medical students in India and 400 women practitioners; 145 hospitals were staffed by women only. One of the leaders of the Association, Dr. M. I. Balfour has just left the country after thirtytwo years of tireless service. The president of the Association is Dr. Margaret MacKellar who graduated from Queen's University in 1890 and the Editor of the Journal is Dr. Oliver (Toronto 1900).

"The Human Testicle." Its Gross Anatomy, Histology, Physiology, Pathology, with particular reference to its Endocrinology, Aberrations of Function and correlation to other endocrines, as well as the Treatment of Diseases of the Testicle and studies in testicular transplantation, and the effects of the testicular secretions on the organism. By Max Thorek, M.D., Surgeon-in-Chief, American Hospital; Consulting Surgeon to the Cook County Hospital, Chicago, Ill.; Octave of 600 pages with 308 illustrations, Philadelphia and London, J.B. Lippincott Company. Price Cloth \$8.00.

This volume is a presentation of the views of the author as to the endocrinology of the testis, rather than a surgical manual. These views are based on ex-

tensive experimental research, and practical experience in the field of testicular transplantation, they are scientifically presented and appear to be based on sound foundations, and certainly do not make any claims for results which cannot be substantiated.

One cannot read the work without coming to the conclusion that there is a definite field for sex-gland transplantation, but that in this work if success is to be achieved the greatest attention must be paid to the material used, and the methods of inserting the grafts. It would appear to be definitely demonstrated that nothing other than homologous, or at least heterologous transplants from the higher apes can be expected to be productive of good results.

The book is extremely interesting, well printed, with good illustrations, but suffers somewhat from repetition, and a somewhat careless text review.

E. R. S.

The Cripples' Journal, 1924, Vol. 1, No. 1, (July).

Price 1 shilling. Published by the Shropshire
Orthopaedic Hospital, Oswestry.

We have received a copy of the first number of this journal, the aim of which is "to deal as comprehensively as possible with all subjects affecting orthopaedies" and appeals therefore "to all institutions, medical men, nursing staffs and helpers." One important reason set forth for the publication of this new journal is that it may "use its influence in the task of moulding public opinion." Sir Robert Jones has contributed a short article dealing with this aim of the journal. Only when public interest is awakened and the ordinary man sees that there is a large preventive as well as a curative side of orthopaedics will the need for proper aftercare facilities be realized. Then the laity will demand these facilities—and they will be provided.

One interesting article deals with "the New England Peabody Home" and A. G. Hunt in "Baschurch and After" tells of the birth of that pioneer orthopaedic hospital. Under the title of "The School of the Sun" a visit to Leysin and the work of a clinic of Dr. Rollier is described. Sir Robert Jones writes an appreciation of the late Prof. R. W. Lovett of Boston and an important section of this magazine contains "Notes from Centres" and tells of the orthopaedic work being done in different parts of England.

Books Received

- Chemical Dynamics of Life Phenomena—by Otto Meyerhof. 110 pages, illustrated. Price \$3.00. Published by J. B. Lippincott Co., 201 Unity Building, Montreal, Que.
- What Does Your Child Weigh—by Dr. E. B. Lowry. 187 pages, price \$1.25. Published by Forbes & Company, 443 S. Dearborn St., Chicago, Ill.
- Everlasting Life—by William W. Keen, M.D., LL.D. 86 pages. Price \$1.00. Published by J. B. Lippincott Company, Montreal.
- A Descriptive Atlas of Radiographs of the Bones and Joints—by A. P. Bertwistle, M.B., Ch.B., Leeds. 198 pages, illustrated. Published by The Macmillan Company of Canada, Ltd., Toronto.
- Principles and Practice of Obstetrics—by Joseph B. DeLee, A.M., M.D. Price \$12.00. 1123 pages with 1128 illustrations. Published by W. B. Saunders Company, Philadelphia. Canadian Agents—The J. F. Hartz Co. Ltd., Toronto and Montreal.
- Medical Gynecology—by Samuel Wyliss Bandler, M.D. Fourth edition. 930 pages, illustrated. Price \$8.00. Published by W. B. Saunders Company, Philadelphia. Canadian Agents—The J. F. Hartz Co. Ltd., Toronto & Montreal.
- An Outline of Endocrinology—by W. M. Crofton, B.A., M.D. 126 pages, illustrated. Published by E. & S. Livingstone, Edinburgh. Canadian Agents—The Macmillan Co. of Canada, Ltd., 70 Bond St., Toronto.

Chlorin Inhalations in Respiratory Infections.-Last March, The Journal published an article by two physicians in the army medical department, listing their results with the use of chlorin inhalations in the treatment of respiratory infections. The work was done in the laboratories of the Chemical Warfare Service and received wide publicity through both the medical and the lay press. Among the reasons fo rthis publicity was the fact that this represented perhaps a special industrial application of war gasses to civilian purposes, and also that it was, in its essential aspects, new. Furthermore, the method was applied, in the first instance, to certain notables of the government with apparent benefit. Some six months have elapsed since the treatment was first announced in a scientific communication. Numerous devices have been advanced and advertised in The Journal and in other medical publications. Several municipal health departments have installed treatment chambers where such devices are undergoing extensive experimentation. Thus far, no other scientific communication than the one first mentioned has appeared in medical literature. It is impossible to state definitely, therefore, whether or not the virtues of the method has been absolutely demonstrated, and it must be considered as still in an experimental stage. The limitations of the use of chlorin in respiratory infections have not been clearly defined. The indications are that chlorin inhalations will not produce bacterial sterilization of the mucous membranes, although they seem to reduce to a considerable extent the number of bacteria found on the tissues. The duration of an adequate treatment, the concentration of gas to be used, the methods by which the gas is to be produced and similar factors are still the subject of experimentation .- Jour. Am. Med. Ass., Aug. 30, 1924.

The Fate of Morphine in the Body.—Recently Takayanagi, working with an improved technique in the pharmacologic institute at the

University of Heidelberg, has observed that the extent of excretion of morphine in the urine may, under certain circumstances, greatly surpass the elimination through the elimentary tract with the feces. When a single dose of the drug is given, the urinary excretion is delayed and slow. In cases in which it has been previously administered, the urinary elimination, following a subsequent dose, may be accelerated. When tolerance to the drug has been established, the excretion through the kidney is lessened, presumably owing to a greater destruction of the substance in the body; at any rate, it does not go preponderatingly into the feces. It is not unlikely that the constipating action of morphine leads to reabsorption of such portions as may have been excreted into the bowel; so that, in the long run, they are destroyed in good measure rather than discharged. Such considerations harmonize with Takayanagi's further finding that less morphine can be recovered from habituated than from nonhabituated animals. But increased destruction will not account for the lack of toxic symptoms in the habitués. The latter often fail to react unfavourably, even when their bodies still contain more morphine than an unaccustomed individual could possibly tolerate. We cannot easily escape the conclusion, therefore, that in some way an immunity of some sort has been developed. That the habituated organism responds differently from the normal, in respect to certain metabolic changes, has been demonstrated in man by Schoen, in the medical clinic at Würzburg. Morphine is 'known to depress the basal metabolism, the decrement amounting to 25 per cent in some cases, soon after an injection. After repeated doses, this depression of metabolism no longer takes place. The acidosis that characterizes the effect of an initial dose of morphine also is missed in the case of persons that have become partially accustomed to the alkaloid. How these failures to respond in the usual way come about in the tolerant subject has not been ascertained.-Jour. Am. Med. Ass., Sept. 6, 1924.

FIRST LISTERIAN ORATION

BY

JOHN STEWART, M.D., LL.D. (Edin.)



UNDER THE AUSPICES
OF THE
LISTER MEMORIAL CLUB
OF THE CANADIAN MEDICAL ASSOCIATION

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LISTER MEMORIAL CLUB

At the Winnipeg meeting of the Canadian Medical Association in 1922, it was suggested by Dr. John Stewart that it would be well for the Canadian Medical Association to consider having an address in honour of Lister at every third annual meeting of the Association. The Council appointed Dr. Stewart as chairman to organize a committee. This committee consisted of:

Maritime Provinces - Dr. John Stewart, Halifax.

Quebec Drs. E. Archibald, G. E. Armstrong, W.

W. Chipman, J. A. Hutchison, Montreal.

Ontario Drs. A. Primrose, Irving Cameron, F. LeM. Grasett, E. S. G. Baldwin, F. N.

G. Starr, Toronto.

Manitoba Drs. R. J. Blanchard, S. W. Prowse,

Alberta Dr. W. H. Macdonald, Medicine Hat.

John Gunn, Winnipeg.

British Columbia Drs. R. E. McKenzie, G. S. Gordon,

Vancouver, Dr. C. Wace, Victoria.

At the meeting in 1923 the Council reappointed the Committee for another year and chose Dr. Stewart, who had been a student clerk, and afterwards a personal friend of Lord Lister's, to give the first oration. Dr. F. N. G. Starr was asked to undertake the duty of collecting an endowment fund. At a subsequent meeting in Toronto of the local members it was decided that the best way to do this would be to organize a club to be termed the Lister Memorial Club, a subscription to which of at least ten dollars would entitle the subscriber to membership. The objective hoped for was five thousand dollars, the interest on which would amount in three years to about eight hundred dollars, and would be available for the expenses of the preparation, delivery, and publication of each triennial oration. A list of members will shortly be published in the Journal.

The first Listerian Oration, published herewith, is very properly concerned with the life and work of Lord Lister himself; subsequent orations may draw not only upon the various themes associated with Lister's life, but may include also the story of all great and important advances in scientific surgery and medicine.

FOREWORD

HE Executive Committee acting for the members of the Lister Club has much pleasure in presenting to every member of the Canadian Medical Association a copy of this special number containing the address on Lord Lister given by Dr. John Stewart of Halifax. The selection of Dr. Stewart by the Council of the Association to deliver this first Listerian oration was a happy one. An earnest student of Lister's, one of his dresser-clerks for several sessions, and one who accompanied him from Edinburgh to London when he accepted the appointment in King's College Hospital, to act first as an externe, afterwards as an interne assistant, Dr. Stewart was recognized by all as eminently fitted by his early education and by his personal qualifications thus to honour the master.

After reading this account of Lister and his achievements, told with the sympathy born of sincere friendship, everyone we are sure will admit that Dr. Stewart has presented us with a delightful and stimulating picture of this great surgeon; one who by his clear and logical mind and persevering investigations has conferred upon mankind an inestimable boon, and has enabled our profession to make marvellous advances in the cure and prevention of disease, and to attempt operations so near the miraculous that the surgeons of his time denied their possibility.

With his name, however, we must ever associate the name of Pasteur. Canada is indeed happy in its ancestry, and in its ability to claim kinship with these two great benefactors of the human race, Pasteur and Lister. In his foreword to the *Life of Pasteur*, by René Vallery-Radot, translated into English by Mrs. Devonshire, Sir William Osler calls attention to the fact that until the researches of Pasteur startled the scientific world, our knowledge of disease had been based almost entirely on observation and experience, and the profession knew little more of the causation of disease than did Hippocrates. It is true that Girolomo Fracastorio, a Veronese physician of the sixteenth century, spoke of the seeds of contagion passing from the sick to the whole, and was the first to draw a parallel between the processes of fermentation in wine and of contagion in disease. An English philosopher in the next century, Robert Boyle, also affirmed that "he who could discover the nature of ferments and fermentation would be more capable than any one else of

explaining the nature of disease." These writers, however, were only as voices crying in the wilderness until Pasteur in 1857, two centuries later, read his first notable paper on Lactic Acid Fermentation before the Lille Scientific Society, and a few months later presented a paper on Alcoholic Fermentation in which he laid the beginnings of biological chemistry by correlating some of the phenomena of life with the conversion of sugar into alcohol and carbonic oxide. The possible analogy between disease and fermentation appears to have been a dominating thought in Pasteur's mind for years. Having proved that spontaneous generation did not exist, and that the changes in lactic, alcoholic, and butyric fermentations were due to living organisms, the question seems to have weighed in his mind: Why should not the same microscopic creatures set up the changes which occur in the body in putrid and suppurative diseases?

These researches of Pasteur met with an eager reception by Syme's young house surgeon, Joseph Lister, who had recently come to Edinburgh from a similar position in University College Hospital in London, and who for several years had been labouring over the problem of why wounds should occasionally heal by first intention, but all too frequently should become suppurating and putrid. While in London he had devoted much time and microscopical study to some cases of hospital gangrene under his care, and had been convinced of their parasitic and local nature. He was therefore quite prepared to recognize the great importance of Pasteur's work.

At the present day we can scarcely appreciate the condition of surgical wards in those days. Only a few years previously had anæsthesia relieved patients from the horror of the knife. The pain of operation now no longer demanded haste on the part of the surgeon, and he was thus permitted to undertake longer and more intricate work. Unfortunately, this increased opportunity appeared only to render the oncoming of suppuration and putrefaction more certain. Sir Clifford Allbutt states that at that date "patients, no matter how critical their need, dreaded the very name of hospital, and the most skilful surgeons distrusted their own craft." James Simpson in the sixties pathetically denounced the awful mortality following operations and uttered a protest against the hospital system itself. It was in this state of affairs, ten years after Pasteur had published his researches on Fermentation, that Lister was able to write to the Lancet calling attention to the flood of light that had been thrown by Pasteur's researches on the problem of

decomposition in exposed organic substances. Pasteur, he said, had convincingly demonstrated that the contaminating properties of air were not due to any of its gaseous constituents, as had for many years been the belief, but were due to the minute germs of various low forms of life contained in it and long since revealed to us by the microscope. These previously had been regarded as merely the accidental contaminations of putrescence, but had now been shown by Pasteur to be their essential cause. Lister claimed that experience in his wards had demonstrated that with their absolute exclusion suppuration and putrescence in wounds could be prevented, and asserted that it was not the hospital ward and its air that was the chief source of evil, but the surgeons' hands, instruments, and dressings. Lister's recognition of the importance of Pasteur's theories of microbic activities, and his application of antiseptic principles in operations and in the treatment of wounds was thus the beginning of modern surgery. As Sir Clifford Allbutt remarks, "Lister saw the vast importance of the discoveries of Pasteur. He saw it because he was watching on the heights, and he was watching there alone." Sir William Osler adds "The prevention in this way of wound infection forms one of the most brilliant chapters in the history of preventive medicine."

Lister was very generous in recognizing the work of confrères. Semmelweiss who discovered the importance of antisepsis in midwifery, and had insisted on the use of chlorinated water for the hands of students before approaching the patient, was slow and reluctant as an author, and was ignored, and his statements opposed bitterly, by his associates in the Hungarian Capital, as well as by the French Academy and by the highest pathological authorities in Germany. This neglect and opposition broke his heart, and he unfortunately died within the gates of an asylum. Not until his story came to the knowledge of Lister through a Hungarian physician practising in London was the value of his methods acknowledged and brought seriously before the profession. Lister promptly accorded Semmelweiss the position of being in a measure his forerunner.

Dr. Stewart in his address has told us the story of a great man who not only did great deeds but had a great heart. He was devoted to his friends, just and generous to his rivals, and patient and persevering under much opposition. Carlyle writes that the grandest of heroic deeds are not always those performed on the battlefield, but are often those performed within four walls and in domestic privacy. Beaconsfield in one

of his volumes writes that one of the greatest legacies of any nation is the memory of a great name and the inheritance of a great example. An anonymous writer in the *Spectator* described Pasteur as the most perfect man who ever entered the Kingdom of Science. Dr. Stewart is right when he places Joseph Lister on the same pedestal.

The future belongs to Science, and more and more will she turn the destinies of nations. We rejoice that two young Canadian graduates have recently accomplished great deeds by their persevering researches, and have written their names as benefactors of the world on the walls of the Temple of Fame. It is our hope that this address on Lord Lister may stimulate many others to pursue the same path and in the same spirit.

A. D. BLACKADER

LISTERIAN ORATION* 1924

By

JOHN STEWART, M.B., LL.D. (Edin.)

Halifax

HERE is a river not to be found on any map of this terrestial globe, yet a river well known to all the sons of men, and never very far from any of us. It flows in the Realm of Time. It is Lethe, the river of Oblivion. What memories of noble persons and heroic deeds, what words of wisdom and what glorious thoughts have been engulfed in that dark, remorseless tide!

To retrieve, if it may be, from its "watery labyrinth" and to preserve something of the character, the appearance, the thought, and speech, the "little unremembered acts" of our heroes and benefactors, as well as to keep bright the story of their life work, is the object of

such orations as this which has assembled us here this evening.

It may seem an extraordinary thing that a memorial to Lister should be thought necessary. Is not his name known and beloved throughout the world? It is probable that none in this assembly, nor indeed in any similar gathering in the world have not in their own persons, or those of their friends or acquaintances benefitted by the work of Lister. There can be no doubt that in the providence of God it was granted to Joseph Lister to do more to save life, to relieve pain, to obviate deformity, and to prevent mutilation than any other man in the history of our race. How then is a memorial needed for him? Because memories are not inherited and the waters of Lethe are bitter with benefits forgot. There are many intelligent people today who know and honour the name of Lister, and who yet have very hazy ideas of what he accomplished. The majority know of him as a great surgeon. So he was, the greatest surgeon since the world began, but they do not know how or why they think him so. Some know he invented a new surgical dressing. So he did, and that dressing has long been among the flotsam of Lethe. Some think he discovered carbolic acid. He adopted it as the most powerful and useful weapon in his battle with disease. His successors have discarded it. They call it poison. It is not upon a new dressing or a lotion, or even upon new methods of operation that Lister's fame rests. He was a great pioneer, he intro-

^{*} Canadian Medical Association, Annual Meeting, Ottawa, June 18th, 1924.

duced new principles, he revolutionized the pathology of inflammation, he made rough and perilous ways smooth and "sweet with certainties," he opened a new and beautiful door into the House of Health, and gave us, his followers, the passport and the key. How many, even among the members of our profession, know of the years of patient toil and profound study, of a veritable agony of sympathy with sufferings which he was powerless to prevent, and of a divine discontent with conditions which made surgery a name of terror instead of a messenger of hope? How many know that he was the discoverer of many of the facts and principles which are commonplace teachings in our textbooks, and, for the most part, without any mention of his name? In what calendars do the dates of his birth and death appear? And what of the great International Memorial proposed and undertaken with such enthusiasm a few weeks after his death? Alas, before the details of the plan could be fairly laid down the Abomination of Desolation came upon us and trampled upon the projects of Peace and we were at war with the people who of all the nations had been the most admiring and enthusiastic followers of Lister. That International Memorial must now wait until the present war, camouflaged as peace, has come to an end.

As regards our own profession there are two notable examples of memorial orations in England, the Harveian Oration, in memory of William Harvey, the discoverer of the circulation of the blood, who may be said to have laid the foundation of scientific medicine, and the Hunterian Oration, in honour of John Hunter, the father of scientific surgery. It was doubtless a knowledge of the success and value of these memorials which determined the Canadian Medical Association to adopt a similar method in memory of Lister. As such, every member of our profession, from the distinguished Faculties of our great universities to the most recent recruit in our ranks, from Cape Breton to the Yukon,

may take a personal, proud, and hopeful interest in it.

Circumstances over which I have had no control have placed me in the position of honour in which I stand tonight. It was my hope and expectation that the Listerian Orations would have been inaugurated by some one of those eminent leaders in our profession who may be considered the scientific successors of Lister, some one preferably, from one of the great centres, Glasgow, Edinburgh, or London, the scenes of his glorious toil, some one whose name and reputation would have lent distinction to the task. My colleagues have decided otherwise. It would indeed be ungenerous and unmannerly of me to shirk this duty, or to fail to thank you with all my heart for the signal and undreamed of honour you have done me. I am not competent to expound the scientific work of Lister. It is my fervent hope that in future orations the various phases of his work may be discussed by eminent authorities in the several departments in which he was an explorer and discoverer. In histology, in pathology, in bacteriology, as well as

in surgery, Lister was an original investigator and his labours have affected and influenced every department of medicine. What I conceive to be my task is first, to make a rapid survey of his career, and then, to tell you, if I can, what manner of man this was, his appearance, his manner of life, his ideals, his influence as a teacher, his methods of work, his attitude to students and to patients, his interest in Nature, and the

workings of his mind.

For this purpose I depend on many ineffaceable memories, on entries in my diaries, old letters of my own and of fellow students, and, not least, on a correspondence of over thirty years with my revered master himself. But for a full account of Lister's life, character and work I recommend two books. First there is the Life, by his distinguished nephew, and the more I have exercised myself in the preparation of this address from among the multitude of my recollections, the more I have admired the judgment, the restraint, and the perfect art of Sir Rickman Godlee. This enthralling book is not only the one authoritative life of Lord Lister, and the main source of information as to his numerous activities, but also the authentic account of the development of antiseptic surgery. The second is his collected works in two large volumes. These were compiled by pious hands as a memorial of his eightieth birthday. They represent an amount of original work which is almost incredible as the work of one man. Many of the papers are of surpassing interest, and one may say that in them are embodied the principia of modern surgery.

I

Joseph Lister was born at Upton House, Essex, on April 5th. 1827. the fourth child and second son of Joseph Jackson Lister. The Lister family were of Yorkshire stock and their ancestors lived in the neighbourhood of Bingley in Airedale. For several generations they had been members of the Society of Friends. Their religious beliefs, their manner of life, and at that time even their dress and conversation separated to a certain extent "the people called Quakers" from their fellow citizens; many of the ordinary amusements and recreations were considered unprofitable and frivolous. But they were not a gloomy so-The characteristic mood of the Friend was one of cheerful gravity, and the child grew up in an atmosphere of love, joy, peace, and cheerful industry. "His family was a lively and a human one..... They had their rides, games of cricket and bowls, skating in winter, and merry evening parties.....and whether at work or at play there never was any question that life was a gift to be employed for the honour of God and the benefit of one's neighbours."

Lister's father, Joseph Jackson Lister, who was a prosperous wine merchant in the City, was a very remarkable man. He was well educated, a good Latin scholar, and with "a sound knowledge of French and German." But his scientific reputation, world wide, was due to his studies in optics, to which he devoted his spare time. It is to his researches that we owe the modern achromatic microscope. He was not only an authority on the making of microscopes, but he was an expert microscopist.

I like to think of the little boy accompanying his father on his walks, collecting objects for microscopic investigation, and peeping through the magic tube at the marvels of that world of the infinitely little which

was one day to be of such surpassing interest to him.

He was educated at private schools. He was a bright, intelligent boy, very apt, especially in classics, but his interests were those of the ordinary healthy school boy, as his letters of that period show. When he was twelve years old, Godlee tells us, his master reported, "He finds no difficulty in his learning...... I have to report favourably of his conduct. He is full of spirits, which sometimes cause him to overstep the rules of order and bring him a little into disgrace." In this school the boys were well grounded in classics, mathematics, natural science, and modern languages; also in the writing of essays.

His favourite subjects would appear to have been natural history and chemistry. In his holidays he collected and studied flowers, dissected small animals, prepared and articulated their skeletons, and thus acquired the remarkable manipulative dexterity which was to serve him so well in his studies of a later date. He had an unusually reten-

tive and accurate memory.

I have dwelt on these memories of his childhood because the child is father of the man and coming events were casting shadows before. His father seems to have had some pre-vision of his son's career, for he preserved all his letters. Godlee has given us one charming example, written at the age of fourteen, which I shall quote as it shows the tendency of the boy's mind, his joy in the work of his hands, something of his sense of humour, and a glimpse of the unusually intimate confidence

between father and son.

"As this is the last day I shall be here for some time, I thought I must just write a short note to thee to tell thee how I spent my time when Mamma was out, and also after she came home. When Mamma was out I was by myself and had nothing to do but draw skeletons, so I finished the cranium and named the bones of it, and also drew and painted the bones of the front and back of the hand and named them. Mamma came home on seventh day, at about 2 o'clock, and in the evening, with John's help, I managed to put up a whole skeleton, that of a frog, and it looks just as if it was going to take a leap, and I stole one of Mary's pieces of wood out of one of the drawers of the cabinet in the museum, to stick it down upon, and put it on the top of the cabinet with a small bell glass over it, and it looks rather nice. Do not tell Mary about the piece of wood."

At the age of seventeen he was sent to University College, London, and graduated B.A. (Lond.) in 1847. His father considered this was

an essential preparation for a medical career and Lister himself always recommended it to students if time and money could be spared.

During his arts course he had studied with too much ardour, and he had also had an attack of small-pox and a nervous break down, and was unable to begin his medical studies until 1848. While still a child he

had expressed a wish to be a surgeon.

His teachers at University College were men of eminence. The lectures of Professor Graham, famous for his pioneer work on crystalloids and colloids, had great interest for Lister. The two who had the greatest influence upon him were Sharpey the physiologist and Wharton Jones, who was Professor of Ophthalmic Medicine and Surgery, but also a man of great originality as an investigator, and whose studies on the circulation as seen under the microscope, and on the phenomena of inflammation probably inspired Lister to take up this line of research. He was house physician to Walshe, one of the great authorities of the time on diseases of heart and lungs, and was house surgeon to Erichsen, whose well-known text-book on surgery was the most popular on the subject in England and America for many years. After a student career of the highest distinction he graduated as M.B. London, and also took his F.R.C.S. in 1852, at the age of twenty-five.

While still a student he had done a good deal of original investigation. In 1852 he made a study of the muscular tissue of the iris, in which he confirmed the conclusions of Kölliker, the eminent German histologist, which had not been generally accepted, and he made several

original observations.

This research, and others carried on in 1853, on the structure of involuntary muscle, were published in the *Journal of Microscopical Science*, and attracted a good deal of attention at home and abroad.

He was now about to make the usual post-graduate tour of the continental hospitals and settle as a consulting surgeon in London, when by the advice of Professor Sharpey he decided to spend a few weeks in Edinburgh to see the practice of Professor Syme. This remarkable man, of whom it was said he never wasted a word, a drop of ink, or a drop of blood, was a teacher of great originality and one of the most brilliant operators in the history of surgery. He was then about fifty-four years of age and in the prime of his power. Between him and the young Englishman a mutual regard and affection seem to have arisen at once. He had the shrewdness to recognize the genius of the earnest young man of half his age, and Lister was greatly impressed by the novelty and originality of Syme's teaching, the boldness and simplicity of his operations. He had come to Edinburgh to spend a month; he remained for nearly seven years. The brilliant young graduate and ex-house surgeon of Erichsen was glad of an opportunity to revert to the position of house surgeon to Mr. Syme. It was a fortunate decision. Syme soon gave him a free hand in a great deal of the work and had him as his private assistant. He became a leader among his fellow residents and the students; within two years he became a Lecturer in Surgery at the Royal College of Surgeons, and three years after his arrival in Edinburgh he was elected an Assistant Surgeon to the Royal Infirmary. During these years he had continued his microscopical studies in physiology and pathology, and two of these were among the most important in the history of medicine, namely that "On the Early Stages of Inflammation", and another "On the Coagulation of the Blood." These embodied original discoveries and observations. That "On the Early Stages of Inflammation" was read at the Royal Society in London on June 18th, 1857, sixty-seven years ago to-day. I think that should be a festal date in the surgical calendar, for this research laid the cornerstone of modern surgical pathology. The researches "On the Coagulation of the Blood" were not completed for some years and they formed the subject of his Croonian Lecture at the Royal Society in London, June 11th, 1863.

These were happy and fortunate days for the young surgeon. His researches were attracting the respectful attention of the leading pathologists throughout the world, and, if the secret of happiness is joy in the work of one's hands, Lister was happy, for in this kind of work his heart delighted. But for him the happiest and most fortunate event of this period was his marriage to Agnes, eldest daughter of Mr. Syme. In one respect the step probably caused Lister some anxiety. For, as his biographer tells us "in those days when a Quaker married one of another denomination it led almost invariably either to resignation of membership in the Society, or to disownment. In such a seriously minded family as Lister's, this was naturally a cause of considerable regret." But the ancient rule holds. A man leaves father and mother at the call of a true love. It was an exceedingly happy marriage and it brought no change in the affectionate relations between Lister and his own family. "Later he became a member of the Episcopalian Church. In this communion he found peace and satisfaction, holding as he did that true religion stands neither in forms nor in the formal absence of forms.'

In 1860 he was appointed Regius Professor of Surgery in the University of Glasgow, and in the same year, at the early age of thirty-three he became a F.R.S. His reputation as a scientific man and a practical surgeon was becoming world wide. But the greatest distinction was yet to come. There is another date I suggest for the surgeon's calendar. It is August 12th, 1865, when James Greenlees aged eleven years was admitted into the Glasgow Royal Infirmary with compound fracture of the left leg, and was treated "antiseptically." This is Case 1 in Lister's first paper "On a New Method of Treating Compound Fractures, Abscesses, etc.," published in the *Lancet*, Vol. I, 1867.

The Renaissance of Surgery had begun.

Ever since his student days Lister had been gravely affected and depressed by the great mortality of surgical operations and the inexplicable uncertainties attending the so-called hospital diseases. So had many surgeons for many generations. The majority seem to have resigned themselves to the belief that such unhappy results were inevitable. Lister could not accept this. He grieved and he pondered. About the year 1861 he taught that suppuration in wounds is determined by the influence of decomposition or putrefaction in the discharges. But what was the cause of this decomposition? It had long been thought to be some mysterious action of the atmosphere. Then came Pasteur with his epoch-making researches on Fermentation. Lister studied these. His sound knowledge of chemistry and his long series of microscopic researches had prepared his mind to accept Pasteur's teaching. As he himself said, "When it had been shown by the researches of Pasteur that the septic property of the atmosphere depended, not on the oxygen or any gaseous constituent, but on the minute organisms suspended in it, which owed their energy to their vitality, it occurred to me that decomposition in the injured part might be avoided without excluding the air by applying as a dressing some material capable of destroying the life of the floating particles.'

Lister's Antiseptic System was founded on the Germ Theory as

enunciated by Pasteur.

As we now look back on the long years of Lister's struggle to develop and perfect his system we are struck by two things. In the first place we admire the skill and ingenuity with which the scientific knowledge of the time was applied to wound treatment. There was never anything unscientific or unreasonable in Lister's work. The knowledge of the time, the experiments of Pasteur, of Tyndall, of Lister himself, and they are among the most beautiful and interesting in the history of science, all went to show that the pathogenic germs existed in the air and that these air-borne germs were the danger, and the spray, which occupied so prominent a place in his system was devised in the hope of

purifying the air.

In the second place we are amazed by the objections to Lister's "reformation." One reason undoubtedly was that the average practitioner of the time was not sufficiently educated in the fundamental sciences of chemistry and physiology to appreciate the work of Pasteur and Lister. But our wonder grows as we consider the evidence available before the eyes of the objectors, in the results of the new system. Lister's opponents asked for statistics. Lister was too busy studying and experimenting to trouble with statistics. Time was to tell. But the statistics of even the most successful surgeon of the day were not in the same category as Lister's. When an eminent professor published a series of two dozen successive amputations without a death, Lister could claim that by his method a large number of these cases might have had their limbs saved.

In 1869 Lister succeeded Mr. Syme in the chair of clinical surgery in Edinburgh. I have always felt that this second Edinburgh period.

was the happiest in his life. He was convinced that he held the key to success in wound treatment, the experience of every day confirmed this faith and unfolded new visions of undreamed possibilities of saving lives and limbs. He knew there were many objectors and opponents. one exception his surgical colleagues in Edinburgh were hostile to his teaching, or only half convinced. His one out-and-out disciple was his assistant-surgeon Mr. John Chiene, afterwards Professor of Systematic Surgery. But he saw that many earnest surgeons throughout the world were interested, and that the young men, with whom the future rests, were enthusiasts with him. He must have felt his heart strengthened and his courage fired as he saw cases in his wards recovering from severe injuries and serious operations in a way hitherto unknown. Surgeons from all countries were coming to see his work and returning to inaugurate his methods in their own hospitals. And by this time some of his own students had left Glasgow and Edinburgh and either at home or in the colonies were lighting beacons of health and healing, "shining like good deeds in a naughty world.'

Three somewhat notable events, which had marked influence on the spread of his system, occurred during this period. In the summer of 1875 he made a prolonged tour in Germany, partly to see for himself how his doctrines were applied. German surgeons had shown more interest in his work than those of any other country, with perhaps the exception of Saxtorph of Copenhagen, Kocher of Bern, and Lucas-Championnière of Paris. His reception was enthusiastic. In the words of the Lancet, "the progress of Professor Lister has assumed the character of a triumphal march." Small wonder that such a city as Munich should receive him as a benefactor. The condition of their great hospital had become so bad, that, a few months before Lister's visit, it was on the point of being closed or even destroyed. Eighty per cent of all wounds, accidental or operative, became infected with hospital gan-Then, as Professor Nussbaum himself said, "When, in 1875, at one decided stroke I organized the clinic on Lister's principles, this disease disappeared as by magic, and has not since showed itself in a single case.'

Then there was the meeting of the British Medical Association in Edinburgh in the same year when Lister gave demonstrations of his method of operation, and of dressing wounds and showed many cases. These demonstrations created a profound impression. He was at pains to point out that the good results shown were not due to his own personal care, but to the fact that the cases were treated on a new principle. "Mr. Rice, my house surgeon, does these things exactly as I do them myself."

And in 1876, at the invitation of some of his friends in Philadelphia, he visited the United States and took part in the proceedings of the International Medical Congress held at the time of the Centennial Exhibition. His reception was most cordial and he was made President of

the Surgical Section. This visit did much to stimulate American surgeons to adopt his system. He addressed medical students both in Boston and New York, and in a clinical lecture shortly after his return he told us of the earnestness of the American students and their "readiness to receive doctrine." He hoped that his visit "had been made at

an opportune time."

These tours must have been a grateful relaxation from the incessant work of this period. It was indeed a time of intense intellectual energy. In addition to his clinical teaching, and his prolonged ward visits, during which he himself dressed many cases in order to show the students and the many visiting surgeons the novel and interesting features of his work, he was devising and introducing new operations, he was occupied with chemical and physical researches bearing on his surgical dressings and in the preparation of the catgut ligature, and he was also one of the pioneers, working literally night and day, in the new science of bacteriology.

And now this glorious period was coming to a close. In 1877 Lister was called to London. This is not the occasion to discuss his decision. Perhaps he was influenced by the fact that London was now the chief centre of opposition to his teaching. For us, his students, it was a day

of woe when the final decision came.

On June 18th, 1877, forty-seven years ago to-day, he was elected to the chair of Clinical Surgery in King's College Hospital, vacant through the death of Sir William Fergusson. The earlier months of the London period were undeniably depressing. The change from an attendance of two or three hundred at a clinical lecture to a straggling dozen, and the small number of patients was not a pleasant one. The consciousness that on the part of some of the Governors and staff of the Hospital there had been strong opposition to his election was certainly unpleasant.

Gradually the results of his operations aroused interest. It was very noticeable that it was among the younger men, the house surgeons and registrars at the hospitals that the chief interest was shown, and among these were some of the future leaders in London surgery. majority of the leading surgeons were still unconvinced, but the leader of them all, the "fine flower" of English surgery, Sir James Paget, was friendly and approved his system, and I know of at least one important case in which on his advice Lister was called in to operate. Two years later I had a letter from Lister in which he said: "The utter apathy in my small and irregular audience was sometimes almost more than I could endure. Now, however, things are greatly altered for the better... Seventy-three have enrolled themselves in my class this summer.....At my last lecture my house surgeon counted between eighty and ninety in attendance and these remained to the end of the lecture, instead of any straggling off as of old during its delivery. It is a great comfort to me to have Cheyne as Assistant Surgeon and he cannot fail to be very useful to the school. Already his work on the relations of organisms to antiseptic dressings has given him a good scientific position."

The year 1879 marks a notable epoch in Lister's career, and in the progress of antiseptic surgery. It was in this year that Mr. Savory, one of the most brilliant surgeons of London, in the Address in Surgery at the meeting of the British Medical Association in Cork, criticised Lister's theories and practice, threw discredit upon all he did, and declared that results just as good as Lister's could be obtained by ordinary methods.

In the same year, at the International Medical Congress in Amsterdam, at which Lister gave an address replying to various objections made to the antiseptic system, "he was received," as the British Medical Journal reported, "by the whole Congress with an enthusiasm which knew no bounds. When he stepped forward to the desk to open his address (which was delivered with but few notes in improvised French) the whole assembly rose to their feet.....with deafening and repeated rounds of cheering and waving of handkerchiefs. This was continued for some minutes until Professor Donders.....taking Lister by the hand said, 'Professor Lister, it is not only our admiration which we offer you, it is our gratitude and that of the nations to which we belong.'"

From this time on Lister was the acknowledged head of the surgical world. Honours now began to come to him. In 1880 he received the honorary doctorates of Oxford and Cambridge. In 1883 he was made a Baronet. In 1892 he retired from the professorship of surgery, having reached the age of sixty-five, the retiring age for professors at King's College. At the request of the Hospital authorities he continued in charge of wards for another year. In this latter year also, 1893, the greatest sorrow of his life came to him in the death of Lady Lister. Perhaps the best idea of what Lady Lister was, may be guessed from words used by their old friend, Dr. John Brown, of "Rab and his Friends," when they were starting in life thirty-seven years before. Looking back upon a childish illness of hers with several days of unconsciousness, he said, "Lister is one who I believe will go to the very top of his profession, and as for Agnes, she was once in Heaven for three or four days when she was a very little child, and she has borne the mark of it ever since."

Lister never was the same again. But he still tried to keep up his interest in science and surgery. He became Foreign Secretary of the Royal Society, and in 1895 succeeded Lord Kelvin in the Presidency.

About this time I had a letter from him in which he says, "To me as far as my work is concerned, dear surgery is for the most part a thing of the past. For some time I have found myself handing over serious operations to Godlee or Cheyne, and I have long felt it to be a thing of doubtful propriety for a surgeon to see cases in consultation when he has ceased to operate. It is so very different a thing to advise another man to undertake a piece of operative work from what it is to be prepared to undertake it yourself. So I have applied this view of the matter to my own case, and since the beginning of the present year (1896)

I have declined to see patients except a few old friends. But, as you are aware, I have other duties of no inconsiderable kind as President of the Royal Society. I daresay you can believe that I had no desire for this office. In fact I did almost all I could to get off. Yet I find the work in connexion with the meetings very interesting, and the association with men in high position in various branches of science is as pleasant as almost anything can be to me in my altered life..... One speaks of the blessedness of memories of the past. I hardly know how I should have got on without them. They are a daily solace to me."

In 1897 he was raised to the peerage, and in the same year he visited Canada, and many now here present must have vivid recollections of the impression made upon them by his unaffected simplicity, his gracious dignity, his clear, musical voice, and his evident pleasure in all

he saw.

In 1898, at seventy-one, he received the freedom of the city of Edinburgh, in company with Lord Wolseley. In his speech he naturally referred to his old associations with Edinburgh. He said, "Here I spent some of my best and happiest years. The enthusiastic students it was always a joy to me to teach, and with my colleagues.....my relations were of the most cordial description. I also received from Edinburgh a gift which I cannot name, but which was to me a source of unspeakable blessing." He also said, "I feel that the honour I have received is much enhanced by the fact that it has been conferred, on the same day, on the illustrious head of the British Army. The work of a General of the very highest rank like Lord Wolseley has certain analogies to that of the ideal surgeon. For the cure of ills in the body politic he performs operations, bloody, painful, dangerous. But he executes his task with the least possible expenditure of human life and human suffering, and he addresses himself to his work in the spirit of self-denying, self-sacrificing devotion." One realizes that in Lord Lister as in Lord Wolseley the "Character of the Happy Warrior" is displayed.

The Third Huxley Lecture delivered in 1900 when he was seventy-three, was the last of his great public addresses. But a year later, at the second Tuberculosis Congress in London, when Koch made his amazing and disquieting assertion that human and bovine tuberculosis were separate and distinct diseases, and that there was practically no danger of the infection of human beings from milk, butter or meat derived from tuberculous cattle, Lord Lister, who was in the chair, showed how thoroughly he had kept in touch with the advance of bacteriology, and his speech, in its lucidity, authority, and tactful courtesy to the il-

lustrious visitor, was a masterpiece.

In 1902 he received the Order of Merit, being one of the twelve ori-

ginal recipients.

In 1903 he had a serious illness which kept him more or less an invalid for the rest of his life. He was much crippled and unable to continue active exercise.

There was a wonderful celebration of his eightieth birthday, April 5th, 1907, when congratulatory letters and telegrams came pouring in

from all parts of the world.

His last public appearance was on June 28th of the same year, when he was present at a crowded gathering in the Guildhall, to receive the freedom of the City of London. He was now a feeble old man. After the Lord Mayor's address "Lister spoke in a low voice a very few words of thanks, and so passed away finally from public view."

In 1908 he retired to the quiet seaside town of Walmer. Even then there is evidence of his desire to continue work. During the summer he wrote to me at some length discussing Bier's treatment, and in 1909 he sent to the medical journals a communication on the subject of the cat-gut ligature. He was still hopeful. Godlee tells us he was always hopeful, "Even when he became weaker and weaker, and months lengthened into years his horses stood in the stables in London ready to take him home..... In the summer of 1909 sight and hearing became much impaired. He could no longer read nor write, but he dictated many letters, mostly filled with kind enquiries.....and listened with interest to the reading aloud of books and papers, not omitting the medical journals. As the autumn came on he was almost confined to his bed. Occasionally on fine mornings he sat in a chair to watch the sun rising over the sea."

He was ever a lover of the morning. And on the morning of Feb-

ruary 10th, 1912, he passed from earth.

No man would have been more welcome to the honour of a grave in Westminster Abbey, but he had willed to lie beside the wife of his youth. There was, however, a solemn and impressive public funeral in the Abbey, and the coffin was then taken to the West Hampstead Cemetery with the sorrow not only of an empire, but the mourning of a world. The *Times* obituary notice said, "No panegyrics are needed, the greatest modern Englishman is dead."

II

It is now fifty years since I became a student of Professor Lister. He was then in the prime of his strength and activity. In face and figure he was one of the handsomest men I have known. His brown hair was beginning to turn grey. His bright expressive eye was a clear hazel colour and he had a pink and white complexion which any debutante might envy. He was tall, about five feet eleven, exceedingly well proportioned, active in his movements and gave the impression of vigorous health and strength. With all this manly grace and vigour, and an energy that carried him swiftly through the corridors of the hospital, and up the stairs, two steps at a time, there was then, and on into serene old age, an indescribable air of gentleness and even shyness. I always felt there was a quaint fragrance, so to speak, of the innocent happy child in Lister. Two or three portraits have been painted of

Lister but none that have satisfied me. There are several photographs, some of them very good, but it would take a Raeburn to paint Lister's face. The best portrait that I know is a portrait in words. It was done by William Ernest Henley, and this is it:

"The Chief"

His brow spreads large and placid, and his eye Is deep and bright, with steady looks that still. Soft lines of tranquil thought his face fulfil—His face at once benign and proud and shy. If envy scout, if ignorance deny, His faultless patience, his unyielding will, Beautiful gentleness and splendid skill. Innumerable gratitudes reply. His wise, rare smile is sweet with certainties, And seems in all his patients to compel Such love and faith as failure cannot quell. We hold him for another Herakles, Battling with custom, prejudice, disease, As once the son of Zeus with Death and Hell.

He was always plainly dressed, the conventional frock coat and silk hat of the professional man in Victorian days, a narrow black tie in a bow knot, mother-of-pearl shirt studs, and, usually, light grey trousers. Sometimes he wore a light fawn coloured overcoat. He was fond of horses and we used to think his favourite pair, a black and a dark grey,

the finest pair that drove to the hospital gate.

His early interest in birds and flowers, which his wife also shared, continued throughout life. They spent their holidays together, generally in country places. Lister was an accomplished botanist and loved to collect and classify the plants of any district, at home or abroad, where they spent their holiday. Although not an expert angler, he was very fond of fishing. The holidays were active, physically and mentally. Notes were kept of plants and birds and scenery: he was interested in languages and dialects. There are many glimpses in Godlee's charming book of his joy in life. We see the exultant morning plunge into the sea of the strong swimmer, we see him lending a hand at the oars with the boatman, returning from a happy day's excursion, with successful fishing, on a Norwegian fjord. There are walks in Skye, or along the Cornish coast, with his vasculum slung on his shoulder, and field glass in hand for the study of birds. He and his wife seem to have enjoyed their holidays like a pair of happy children. They both had a keen sense of humour which enabled them to find infinite amusement in even the occasional discomforts of travel.

Lister's sense of humour led him sometimes to include in puns, and he admired the gift in this peculiar art of Thomas Hood. One of his favourite puns, used sometimes to give point in a clinical lecture was based on a Scottish pronunciation. In describing the discolouration

of a gangrenous limb he would say, "it has gaen green." Alluding to his preference for chloroform over ether as an anæsthetic he would quote,

"How happy could I be with 'ether'
Were t'other dear charmer away."

One day when the instrument clerk had omitted to put a probe in the tray Lister looked at us gravely, but with a twinkle in his eye and said,

"Watson has been very *improbus* as regards that probe."

No memory of Lister is complete without the picture of him entertaining friends in his own house. He was the perfect host. Cares and anxieties were laid aside, his sole object was to make his friends happy. This hospitable spirit showed itself early in his career. The "high spirits" of the boy of twelve, perhaps somewhat repressed by the arduous studies of the next twelve or fourteen years, appear to have flourished afresh when he was transplanted to Edinburgh and came among the high spirited, if also studious youths who are indigenous there. He soon became a great favourite and formed some of the dearest friendships of his life. He was fortunate in being exempt from anxiety on the score of pecuniary embarrassment, and had no desire for display or a foolish use of his means. But he loved to entertain friends.

I was told by Mrs. Porter of a famous supper he gave his clerks and dressers on the occasion of the furnishing of a new ward for Mr. Syme. Mrs. Porter, whose memory all old Edinburgh "medicals" revere, she of the silvery hair, black eyes and rosy cheeks, who has also been portrayed by Henley in one of his inimitable word pictures, had been Syme's head nurse for years before Lister came. She worshipped Syme and she loved Lister as if he were her own son, and the tears rolled over the "sweet old roses of her sunken face" when Lister left Edinburgh. It was she who told me of the narrow escape Lister had in attempting to climb, with another high-spirited youth, a cleft known as the Cat Nick, in the Salisbury Crags, and gave an idea of the consternation that fell upon them all as the victim was carried into the Infirmary where he had to stay in bed for a fortnight. And we know that when his companions gave a dinner in honour of his marriage they were a merry company and that he joined them in singing appropriate ditties. All who have any recollection of that circle of friends know that their merriment was both hearty and wholesome. "At times his fun and merriment were like that of a boy." He was fond of music and especially of Scottish songs.

Thanks to his retentive memory and his unusual power of application he had a wide acquaintance with the best literature. From my own observation I concluded that his favourite books were the Bible, Shakespeare, and Horace. He was also fond of Milton, Dante, and Goethe and could repeat from memory, for the entertainment of friends, long passages from these writers. Soon after his arrival in Edinburgh he purchased a copy of Burns' poems and knew these well. His favourite author on pathological and surgical subjects was John Hunter, whose works he described as "That remarkable treasury of original observation and profound reflection." He had marked linguistic ability. He had such a command of French and German that on his Continental tours he was able to address medical societies in these languages. He acquired some knowledge of the language of all the countries he travelled in.

His bearing towards his hospital patients was always one of unaffected kindliness and personal interest. But it was with children that his kind, warm heart showed itself. Childless himself, the sight of a child, especially a suffering child, seemed to awaken deep feelings of interest and affection. In my ward there was a small "street arab" whose wrist Lister had excised. I was dressing the case one day while Lister was making his tour of the ward with his house surgeon and the students. The lad was paying no attention to my proceedings. His eyes were following the Chief. When he had gone the boy said to me, "I think its the little yins and the auld wimmin he likes best."

Sir Hector Cameron tells a delightful story showing Lister's love of children. On one occasion when visiting his wards he found a little girl in tears because the nurse had taken away her doll. On enquiry it turned out that a tear had been inflicted on the doll's body and sawdust was escaping on the sheets of the child's cot. Lister at once asked the nurse to bring him the doll, also a needle and thread. Sitting down by the child's cot he sewed up the wound, thus staunching at the same time the "hæmorrhage" of sawdust and the tears of the little girl to whom the doll was restored.

Among the happiest recollection of those Edinburgh days are those of the Sunday afternoon visits. This was one of Lister's ways of keeping the Sabbath day. The coachman and the horses had a rest. Lister came to the Infirmary on foot. The picture is plain before me now. It is the old Reserve Ward, a large ward for men, and about two o'clock on a summer afternoon. Clerks and dressers, and some students from other clinics, are standing about, chatting together, or talking to the patients. The instrument clerk, in charge of the famous spray is seated on the broad window sill at one end of the ward, now examining the flame of the spirit lamp, or touching the safety lever to let steam escape, for the spray must be kept ready for instant use, and now looking across the smoky roofs of the old town, where his eyes rest on the blue gleam of the Forth, "North Berwick Law with cone of green, and Bass amid the waters." Then some one suddenly says, "Here comes the Chief!", and we see our hero come through the little side-gate, down the slope, with his easy rapid stride, a light cane in his hand, and on his handsome face a look of happy meditation. The house surgeon meets him at the main door, and in a few minutes they enter the ward. Students come to attention, patients' faces beam. I wonder if there were anywhere else in the world a surgeon whose pupils held him in more reverent admiration, whose patients so trusted him, loved and positively adored him. He cannot be unconscious of this feeling, the "soft lines of tranquil thought" grow softer, that "face at once benign and proud and shy" is suffused with the unaffected pleasure of this modest and simple minded great man as he begins his tour of the ward. It was his wish on Sunday to see every patient in his wards, and as we often had sixty or seventy, this meant a visit of three or four hours. He goes from bed to bed, occasionally conversing with a patient, or discussing a case with the house surgeon, and perhaps himself changes a dressing, drawing the attention of dressers and students to clinical facts, but never using a word to alarm or distress a patient, and performing his manipulations with the gentlest, steadiest, firmest hand which any sufferer could dream possible.

And so through all the men's wards, then downstairs to the women and children. How their eyes followed him! And perhaps the visit ended in that famous little ward at the back, a room really meant for one bed and one patient, but in which there were two big beds: in one lay or sat, looking at picture books or playing games, three small boys, Tommy Miller, Roden Shields, and Willie Shotts, all "chronics," spines and joints, doomed to early death or at least deformity and lameness but for him, and all happy and recovering. And in the other bed the tall, gaunt, russet-bearded figure of Henley the poet, who lay there with a saved limb, musing and framing his "Sketches in a Northern

Hospital."

Ш

When Lister left Edinburgh for London he was just fifty years of age. He had been practising antiseptic surgery for twelve years, and this is a suitable point at which to survey the results of his work during

that period.

1. The mortality of surgical operations had been greatly reduced. For example, the average mortality in amputations at this time was thirty-three per cent, one death in every three cases. In Lister's hands the mortality was one in ten. Further, the number of amputations was reduced, for antiseptic surgery had made it possible to save many limbs formerly condemned to amputation.

2. A vast new field for surgical treatment had been opened up. Operations for deformities of the bones, for un-united and badly united fractures, for diseases of joints and for radical cure of hernia were done

safely.

3. The maleficent trinity of hospital diseases, Erysipelas, Pyæmia, and Hospital Gangrene, were practically abolished in the wards of Lister and his followers. Sporadic cases of erysipelas might occur, but this disease did not attack operation wounds treated antiseptically. A rare case of pyæmia might occur after operation but only in cases where thorough antisepsis could not be carried out, as in operations on the jaws.

The reader of a paper before the Royal Medical Society in Edinburgh in 1877, quoted from the Hospital Reports that Lister had had two cases of pyæmia in eight years, while in another service in the same hospital

there had been forty-three cases in the last five years.

And yet even at that date he had to meet with great opposition. From an apathetic indifference to violent and even vituperative contradiction the bulk of the profession had ranged itself against him. It was not only that too many medical men were unable to appreciate the germ theory, but there was something bordering on insolence in the indifference of many. It is a fact that there were colleagues of Lister who ridiculed and opposed him, and yet never entered his wards to see for themselves the results of his practice. Lister's attitude toward these opponents was characteristic. When a very distinguished authority had occupied several columns of the Lancet with an article showing that in Lister's method, what was of value was not new, and what was new was of no value, Lister replied in a letter of eight lines, merely saying that if his critic would do him the honour of coming to his wards and seeing his cases, he might perhaps modify some of his views. If those "captious contradictors" had adopted the maxim "by their fruits ye shall know them," and had taken the trouble to visit Lister's wards, they could not have failed to see the unspeakable superiority of his methods, whatever they might think of his theories. They would have seen, in some of the best hospitals and under the care of the foremost surgeons in Britain many cases of septic fever. They would find patients exhausted by long continued discharge from their wounds. They might see a recent amputation case dressed, say one week after operation. On removal of the pus-soaked dressing the stump is seen, swollen, red, and tender, pus oozes from the wound, between the sutures, and trickles down strands of dirty ligatures hanging from the angles of the wound. In spite of the gentlest handling, the dressing is a painful process and may have to be repeated two or three times during the day. A sense of anxiety and gloom seems to affect the patients, and over all hangs the heavy unpleasant odour of suppuration. And this in spite of all ordinary rules of cleanliness as regards bedding and linen, floors and walls, which made English hospitals the best in Europe. In spite, too, of the use of many antiseptic and deodorant agents and a rigid enforcement of the regulation floor space. What a different scene in Lister's wards! Temperatures are as a rule normal. There are no cases of continuous suppuration. When the week-old amputation case is being dressed the only sign of the wound may be the row of sutures. No swelling, no redness, no pus, no pain. And the painless dressing may not be required again for three or four days. In these wards no melancholy, but an air of cheerfulness and hope, and no odour other than the aromatic fragrance of pure carbolic acid.

In those other wards there might happen, from time to time, a case of perfect healing, or even a series of "successful amputations." But no

one could count on these results. The issue was always precarious. Lister's wards we might almost say we had a splendid monotony of success. This was not because Lister's wards were more favourably situated or kept cleaner or better ventilated. Quite the reverse. In Glasgow the sanitary condition of his wards had been the worst in the hospital, but after the introduction of his system the results were the best. In Glasgow he was "engaged in a perpetual contest with the hospital board who were disposed to increase the number of beds in each ward." In Edinburgh, on the other hand, he permitted his wards to be crowded, indeed often overcrowded. Two, and sometimes three children were to be seen in one bed and at night mattresses were laid on the floor for those who were able to sit up and move about during the day. In his address before the British Medical Association, in 1875, he said, in discussing the salubrity of his wards, "while I have fifty-five beds, I have lately had seventy-one patients." In the following winter I recollect I wished to get one of my dispensary cases into the hospital, for an operation for ununited fracture of the femur. I went to my friend, Dr. Baldwin, (Lister's house surgeon at the time.) He said, "Well, I have fifty-five beds and seventy-six patients." Yet he found room for my poor man.

Experience had taught that in the absence of suppuration the air, even of a hospital ward, was so pure that occasional overcrowding, even

to so great a degree, had no serious results.

In the face of such results as Lister had obtained, who could doubt? For us, his students, his dressers, there was no shadow of doubt. We knew that we were in touch with genius, with a strong, beneficent genius, of clear vision, indomitable patience, and unshakable courage. In the words of Ogston, of Aberdeen, one of his most brilliant and successful followers, he "had changed surgery, especially operative surgery, from being a hazardous lottery into a safe and soundly based science."

IV

Apart altogether from this great achievement, Lister was a very distinguished surgeon. In fact, the vast and universal importance of his magnum opus has perhaps obscured the brilliance of his work in other directions. While still a young man he was selected to write the articles on "Amputation and Anæsthetics" for Holmes's System of Surgery, the most important surgical work of the time, and these are still classics. He devised new operations and improved others. In 1867 he performed the first recorded radical operation for cancer of the breast, with division of the pectoral muscles and clearing out the axilla. He was the first to suture blood-vessels, and the first to do an osteotomy for knock-knee. He practised bloodless surgery several years before the Esmarch bandage came into use, and his method is simpler and better. His reintroduction and perfection of the cat-gut ligature was itself an epoch in surgery. If rapidity in operating were required he was not wanting in that accomplishment of the surgeon. But his aim was thoroughness,

in contrast to brilliant rapidity, and in this he set the fashion which

characterizes the best surgery of to-day.

He was a pioneer in many fields. In histology he was the first to give an accurate description of involuntary muscular fibre, and he was the first to employ section-cutting in the study of tissues. Reference has already been made to his work in physiology and pathology. He was one of the founders of the science of bacteriology, and was the first to obtain a pure culture of a micro-organism when he isolated, described, measured, figured, and named the *Bacterium lactis*, and he did this by the difficult and tedious process of fractional dilution, the only possible

way before the genius of Koch had devised solid culture media.

In Renan's famous speech, welcoming Pasteur on his admission to the Académie Française, he compared his genius to a species of divination. There was much of this in Lister, there was an almost mysterious insight into vital processes, and in his lectures and writings, there were sometimes almost prophetic hints and suggestions. One instance of this gift is his forecast of the existence of a nervous plexus in the musculature of the intestine, which was discovered shortly after by Meissner. He had evidently some conception of that function of the cells announced years after by Metchnikoff as phagocytosis. Many old students will remember his interest in the action of granulation tissue on dead bone, producing absorption. He described the granulation as "nibbling" the bone.

In reflecting upon the enormous amount of work which Lister accomplished, I have been impressed by two considerations. One is his choice of the morning hours for study. When, as a young man, he was beginning his first course of lectures in surgery, he wrote to his brother, "The way I manage work is by getting up early. I go to bed about ten, and get up by alarum at 5.30, light my fire (laid the evening before) and my coffee boils while I dress. I take it and a bit of bread, work for three or four hours and off to my ten o'clock lecture when my mind is

brimful of it. Then I have the afternoon for the hospital."

But there were occasions when work had to be carried on night and day. In studying the growth of a micro-organism, not infrequently observations had to be carried on during the night and the small hours of the morning. He was also fond of studying in the open air. He loved to meditate in a garden. When in 1869 he returned to Edinburgh as Professor of Surgery, and settled at No. 9 Charlotte Square, he looked forward to meditating in the West Princes Street gardens. "It will indeed be a grand place for the purpose when I have it all to myself before breakfast." Thirty years later we find him pacing to and fro in these gardens in the morning of the day when he was to receive the honour of the freedom of the City and thinking over the speech he was to give.

The other consideration is the great assistance he received from his wife. She entered with affectionate energy into his researches and had a clear understanding of their importance. She was his amanuensis and wrote many of his letters. The many hundreds of closely written

foolscap pages which form his "Common-place books" are in her beautiful clear hand writing. When night vigils with the microscope were required she sat by him, note-book in hand, until the early morning hours, ready to note from his dictation the changes which were going on before his eyes, or the thoughts that occurred to him.

V

Lister was a great and inspiring teacher. The outstanding characteristic of his teaching was its moral earnestness, its insistence on our personal responsibility and duty to our patients, the right use of the "swift and solemn trust of life," the injunction to observe keenly, and

the duty of forming our own conclusions and acting on these.

At the very beginning of his teaching career, when at twenty-eight years of age he became Lecturer at the Royal College of Surgeons, Edinburgh, he was impressed with his responsibilities. In a letter to his brother he says, ".....I was so lately a student myself, I feel I have undertaken a most responsible duty. How much may depend on the principles of practice which I impart to these young men. May I be enabled to discharge the duty faithfully."

A few years later in writing to his father, who feared his son was giving too much time to teaching, in neglect of practice, (Mrs. Lister had referred to "poor Joseph and his one patient"), he said, "I trust, however, that the chief object in my mind is that of doing them good as regards fitting them for treating the diseases of their fellow creatures in

after life."

In a speech made at a complimentary dinner given him on the occasion of his leaving Edinburgh for Glasgow he quoted from his favourite Horace the words, Quid verum atque decens curo et rogo, etc., and said, "for us the verum will ever be the decens, scientific truth as bearing directly upon the well-being of our fellow-creatures, will always be a becoming object of our pursuit, and while there is probably no calling in which there is greater opportunity for deception than in ours, yet when we consider the sacred interests which are committed blindfold by the public to our trust, we must allow that there is no calling in which false-hood is more unbecoming or more despicable."

And shortly after, in his introductory address in Glasgow, he told his students that the two great requisites for the medical profession were "first, a warm, loving heart, and secondly, Truth in an earnest spirit."

The concluding words of his Graduation Address in Edinburgh in 1876 were, "If we had nothing but pecuniary rewards and worldly honours to look to, our profession would not be one to be desired. But in its practice you will find it to be attended with peculiar privileges, second to none in intense interest and pure pleasures. It is our proud office to tend the fleshly tabernacle of the immortal spirit, and our path, if rightly followed, will be guided by unfettered truth and love unfeigned. In the pursuit of this noble and holy calling I wish you God-speed."

I will quote from letters written about fifty years ago, before Lister's doctrines were generally accepted, which may give some idea of the feelings evoked among his students by the matter, and the manner of his teaching.

"We get splendid lectures from Lister. He is so original. We hear things which were never heard before." "He is a good lecturer, he speaks distinctly and makes things very plain. Some think he is not practical, but I think he does better in giving us principles as a solid foundation for our practice."

"At the last clinic of the summer session he advised us 'not to work too hard, to keep up our acquaintance with science, and to remember ours is a high and holy calling." I thought it a good homily on the Phy-

sical, Intellectual and Moral.'

"I heard him say one day that eight years ago he thought his system would die with him, but that now he felt the day was to be won, though he would not live to see it. But he may. I think it is possible

he may live to see antiseptic surgery universal.'

"Long after this, if we are spared to be old men, many a one of us will look back to the old dingy wards of the Royal Infirmary, and think with swelling hearts and dimmed eyes, of him who taught us there. Whatever monument he may get from the world, he has raised his own

monument in our hearts."

A few days ago I had a letter from Sir Hector Cameron, one of Lister's first house surgeons, his first assistant, and his oldest and most intimate friend, outside of his own family circle, and in this letter he recalls "the keen interest and pleasure which were aroused in those of us who listened to his lectures sixty years ago. We felt conscious that we were listening to new and valuable lessons not yet in print. But we little realized how great their value was or what was to be their unspeakable fruitfulness in the fulness of time. Alas! those of us who were privileged to drink of those pre-libations of future glorious progress are now a very small band indeed. I can count them on the fingers of one hand."

I shall now quote at random a few ipsissima verba from my notes

of his clinical lectures:

"I beseech you to form your own opinions. The minds which you bring to bear on this subject to-day are very much the same as they will be throughout your lives. You are as competent as you ever will be to draw logical inferences from established data."

"Mere book-knowledge is of little value, if you have this alone you

are at the mercy of the next man who writes a book."

"The whole object of your existence is to understand and cure dis-

ease in this world, from this time forward."

"If you believe this treatment is safe, and that you will get better results in this way, then it is your duty to carry it out. It is no longer 'May I do this?' it is 'I must do it."

"If a death should result from our carelessness or want of thought

it is not far removed from manslaughter."

"Act upon thoughts as they come. Strike the iron while it is hot. If I have ever done anything it is by acting on thoughts as they occurred to me."

"To intrude an unskilled hand to such a piece of divine mechanism

as the human body is indeed a fearful responsibility."

One day while he was explaining certain anatomical points in connection with an operation, some thoughtless students tittered. Turning round from the blackboard on which he was drawing, he electrified us by an appeal to be attentive to these details, telling us the more we studied them the more we should bow and admire the stupendous Wisdom that planned them all.

As a great deal of the novelty and interest in Lister's teaching was

due to his pathology I add a few pathological aphorisms.

"The subject of the blood is the foundation of all pathology."

"Blood has no inherent tendency to coagulate."

"A wound may be esthetically dirty yet surgically pure." Granulations have no inherent tendency to form pus."

"The injured tissues do not need to be stimulated or treated with any mysterious 'specific'. All that they need is to be let alone. Nature will then take care of them: those which have been weakened will recover, and those which have been deprived of vitality by injury will serve as pabulum for their living neighbours." (1876).

"Healthy tissues are hostile to the development of parasitic organisms. There is reason to believe that the white corpuscles themselves

exert a similar influence." (1878).

"To exclude living organisms entirely from wounds is an impos-

sibility."

"Inflammation may be caused by the action of the nervous system." Surprise has often been expressed that Lister never wrote a book. He aimed at perfection, but perfection is at the foot of the rainbow. His occasional publications were really interim reports of a continuous and prolonged study. Many years ago I was thinking of preparing a paper on antiseptic surgery for one of our medical societies, and I wrote to him enquiring as to the latest developments in his practice. His reply is so characteristic of my revered master that I venture to quote it. It caused me a good deal of compunction to find that my request had trespassed upon his holiday. The letter is dated from Bregenz on Lake Constance where he and Lady Lister were spending a part of their holiday in September, 1886.

"It has often caused me a pang to think that your letter remained unanswered. But at home I am so much pressed with professional engagements of an immediately urgent character that I find it extremely difficult to get half an hour in which to write. Consequently yours has been only one in a pile of letters which I have got myself into disgrace as well as compunction by leaving to a more convenient season..... The fact is that I have been for a considerable time in what I hope will

ultimately prove to have been a transitional stage to something better as regards our antiseptic methods. As regards the spray I confess I have not myself used it since last October. But on the other hand I am sure that if it is not employed, more care must be taken in other respects in order to attain the same results, and I have not felt in a position to publish on the matter as yet and therefore I could not well furnish you with material to publish in my name. As to the dressings also, although I have been labouring for years at endeavours to improve them I have always hitherto seen something further to be done before I could feel satisfied that I had got what I should wish to publish. I really do hope, however, that many weeks will not elapse without my being able to announce some progress. There are such a multitude of conditions to be complied with in order to have a dressing in all respects to be commended that the attempt to fulfil them has sometimes seemed almost like following a Will-o-the-wisp. So you see I really could not comply with your request nor write shortly to explain my inability.'

One of Lister's outstanding characteristics was his modesty. As an instance of this I may say that I never heard him refer either in lecture or private conversation to the fact that he had had Queen Victoria as a patient. He had succeeded Mr. Syme as Surgeon-in-ordinary to the Queen in Scotland. This was no empty title. In 1871 he had the honour, and the anxiety of operating upon Her Majesty. It was a case of deep seated acute abscess in the axilla, and it had a special surgical interest as it was the first case in which he used a drainage tube. In the Collected Papers there is an account of the conditions which led him to use the tube, but with no reference to the identity of his august patient.

Another marked element in Lister's character was his firmness. If after careful thought he had come to the conclusion that a certain operation, or a definite line of treatment was the best thing for his patient, no considerations of danger or of difficulty prevented him from carrying it out. And so with all his beliefs and principles, he kept "the law in calmness made," regardless of the consequences to himself. In 1875 a movement was on foot to promote legislation making it illegal to experiment on animals. Queen Victoria personally asked Lister to support this movement. It is evident from her letter that in her view, with her information, all experiments on animals were "horrible practices." One side only of the question had been before her. Lister replied to her private secretary: "I should deeply regret that I cannot see my way to complying with this request, were I not persuaded that my doing so would not promote the real good of the community, which I know to be Her Majesty's only object in the matter." And he goes on to express his reasons for his opinion in a letter which is perhaps the best thing that ever was written in defence of scientific experiments upon animals.

As to his own kindness and thoughtfulness for his patients I shall narrate a case, which displays at the same time the simplicity and the efficiency of his methods. On the first of August, 1876, a young woman

was admitted to Lister's wards. She came from Devonshire, had been travelling all night, and looked tired, but was otherwise healthy-looking and with rosy cheeks. But it turned out that this was a case of psoas abscess, with angular projection in the lower dorsal spine, indicating softening of the bodies of the vertebrae. As she had been complaining of pain the lady who employed her had called in her own doctor who diagnosed the case and advised that she be sent without delay to Mr. Lister. She was entered in the case book as "Lizzie Thomas, aged 29,

parlour maid, Torquay. Psoas abscess, left side."

One of the maxims of surgery is to open abscesses, but the grim experience of centuries had taught that in this particular sort of abscess, a chronic abscess connected with diseased bone, such a proceeding was disastrous. I shall quote from text books which guided the practice of surgeons fifty years ago. "In these cases we are to content ourselves with rest and general management, and look gloomily to the result." Another eminent teacher says, "There can be no doubt whatever that it is the duty of the surgeon to leave these abscesses alone." And Syme, perhaps the most influential teacher of the era, said the abscess "ought not to be opened since doing so could only accelerate the patient's fate, and bring the surgical art into discredit." And so, in spite of her rosy cheeks, the wisdom of the time saw that "Death had set his broad arrow" upon her. But Lister had changed all this. He did not fear to open the abscess. When he came to the hospital he saw the patient in her bed in the ward, confirmed the diagnosis, and then and there the operation was performed. There was no wheeled stretcher nor white-robed orderly to bear the patient to the shining splendour of a modern operating room, with white enamel and nickelled steel. Students were orderlies, and learned how to lift and carry patients. The patient remained in her bed, and the bed was moved out into the middle of the ward, a screen was set up round it, a student with a pound bottle of chloroform and a folded towel proceeded to anæsthetise the patient. On a small table by the bed there was a tin basin with a 1 to 20 watery solution of carbolic acid, containing a bistoury, a sinus forceps, a drainage tube and a gauze mop. In another basin was a 1 to 40 carbolic solution, with a piece of folded gauze for the "deep dressing." The large dressing and the necessary bandages and the carbolic spray were there. Lister turned back the cuffs of his coat, washed his hands for a few seconds in the 1 to 20 solution, and the area of skin covering the abscess was washed with the same. In a few minutes the patient was quietly asleep, and the abscess was opened. Pus ran freely out, aided by gentle pressure, to the amount of twenty ounces, and the drainage tube was passed into the abscess cavity. The deep dressing, squeezed out of the 1 to 40 lotion, was laid over this, then the usual ample dressing of gauze, then the gauze bandage, and over all, a few turns of elastic bandage. The screen was removed and the patient and her bed replaced. All was over in fifteen or twenty minutes.

It had been a very simple operation. It was also revolutionary: the subsequent course of the case was in rebellion to all the surgical canons of the time. Suppuration ceased, there was no fever, appetite was good and sleep undisturbed. At first the dressings were changed under the carbolic spray every day, the discharge ceasing as the abscess cavity contracted. After some weeks the dressing was done once a week, for comfort and cleanliness. The rest in bed was necessary on account of the diseased condition of the bone.

A year passed and Lizzie Thomas entered on her second year of "rest cure," with rosy cheeks, patient smile, and busy fingers, a great

favourite.

This was Lister's last year in Edinburgh. Early in October he took up his new duties in London, and it was my good fortune to be one of

the staff he took with him.

On October 24th, I had letters from my friend Mr. Caird and from Miss Logan, the staff nurse in the wards that once were Lister's, telling that under the new regime, all patients with these chronic abscesses of spine or hip were to be discharged, and that Lizzie Thomas, who had been recumbent for fifteen months, had been ordered to sit up, but that Mr. Roxburgh, Lister's last house surgeon in Edinburgh and still in charge of these wards, had protested. They wished to know if Mr. Lister would take Lizzie Thomas into King's. I shall never forget the flush that came into his face nor the expression of mingled incredulity, sorrow and indignation as I read this letter. He used the strongest language I ever heard him speak, "It is an infamous shame." Yes, of course he would take Lizzie Thomas into his wards. I telegraphed to Caird and the next day Miss Logan, the staff nurse, with Lizzie Thomas in the basket (a long wicker basket in which patients were carried to and from the operating theatre) left for London by the night express and was taken into King's College Hospital. And that is another story. A few days later a letter from Roxburgh told me of the removal of the rest of these cases, six men and boys, by Mr. Lister's directions and at his expense to private lodgings in Melville Place, where he had had a "nursing home" for private cases.

In January, 1878, Lizzie Thomas developed another abscess, a psoas on the right side, and this was opened. It contained four ounces of pus. This abscess was dressed every day for some time, the other once a week as usual, and on August 1st., 1878, Lizzie Thomas entered on her third year as a hospital patient, and when I left London in October she was

still rosy, smiling, patient and busy knitting or reading.

The next note I have of this case is in a letter from Lister written in June, 1880, beginning "I was reminded of you yesterday by seeing Lizzie Thomas, whose sinus healed at last, a few days ago, walking well in the street and looking well. About three months after you left we had her removed to 15 Fitzroy Square, (a private nursing home). After she had been there some months a fresh abscess appeared in the back

beside the dorsal vertebrae. This was almost enough to make one regard her case as hopeless. But, under antiseptic treatment, it healed in time, as also did the sinus in the right groin. But that in the left groin continued to discharge a few minims per week, till, thinking that the spine must, after the long rest, have become sound, and hoping that exercise would do good to her general health, we allowed her to get up with the gauze dressing and a well applied elastic bandage. The result was that the discharge diminished instead of increasing, and a few days ago the last sinus was found completely cicatrized. Now that it is all over, the long continued care of Cheyne and yourself seems well repaid by the appearance of this amiable, handsome girl restored to health and usefulness."

Fourteen years later he spoke of this case and told me he had lately seen her in Torquay. She was now a healthy woman of forty-seven.

And what of the six men and boys for whom Lister had provided in Edinburgh? One, a poor fellow of about thirty years of age with tuberculous disease of both lungs died a few weeks after removal from hospital. Every one of the others recovered. One of them I believe, became a doctor, and another a journalist.

VI

In an old letter of my own I have found an account of a memorable evening I spent with Lister in 1894. I found him very much changed from what he had been at my last visit three years before. He seemed to have grown ten years older. I had a sad presentiment, fortunately not realized, that I should not see him again. The blithe, almost boyish heartiness of the greeting of 1891 had gone, but the grave smile of welcome was not less sincere. The duties of the hostess were carried out in the most kind and hospitable way by Miss Syme (his sister-in-law) but the spell of a dear and vanished presence was felt by all. It happened that I was the only guest. Mr. Cheyne was to have come, but had been called out of town. After dinner he drew his chair towards my corner of the table and we talked for two hours or so, chiefly of past times and old hospital days. He recalled several cases and discussed them, speaking of some of them by name. He spoke with much feeling about some of his old house surgeons and students, expressing his pleasure in the success of many of them. He was much pleased when I told him of Mr. Caird's marriage, a few weeks previously, and said pleasantly that he hoped he would soon hear the same of me. He was very much interested in diphtheria antitoxin, which had just been introduced and rejoiced in the prospect of success in its use. He had, of course, been greatly disappointed in the expectations formed of tuberculin, a few years before, but said he believed we had in diphtheria antitoxin a real addition to our means of saving life. He described to me at some length the successive steps in the final elaboration of the antitoxin, from the time of its discovery by Behring. We discussed "aseptic" surgery. He was not very happy over the recent changes introduced chiefly by one of his great admirers, von Bergmann. He regretted the abandonment of the simplicity of his own methods. He thought the surgeon would now have to depend on too many assistants. Responsibility would be divided throughout a long chain of assistants, nurses, and orderlies, and at any moment a link might break. He thought that the simply sterile dressing, that is, one containing no antiseptic, a mistake. He foresaw the enormous expense entailed in the newer ideas of hospital construction and equipment. He knew from experience that his simpler methods gave as good results in the dingy wards of an old hospital or in a work-

man's cottage.

I told him of Hoernle's favourite idea that he should write a book telling of the beginnings of his antiseptic work, a history, as Hoernlé put it "of the mental genesis" of antiseptic surgery. Hoernlé, (the late Canon Hoernlé of Leith), one of my fellow students, had, as a medical missionary for several years in Persia, introduced Lister's methods into that country. At this suggestion Lister smiled and seemed pleased, but said he did not feel equal now to very much work. He said, "I would like to say with the Apostle, 'I desire to depart', and I feel this deeply when I think of my dear wife." Then, after a pause, "but we are not to choose these things." He told me he had lately been reading the life of Dean Stanley, and enjoyed it very much. He also knew Stanley's life of Arnold. He was much interested in Stanley. He looked at me with a smile and something of the old twinkle in his eye and said, "Stanlev did not marry until he was forty-eight." From discussing Stanley we got talking about some phases of religious belief and of that philosophy which holds that in the light of modern science all the old faiths in the "Resurrection of the body" and the "Life Everlasting" were untenable. Not so for Lister. He confessed that, for him, if this were the truth there would be no more pleasure or satisfaction in his work. In speaking of men whose lives were exemplars of the Christian virtues but whose intellectual convictions denied the Christian revelation, he said, "These men are better than their creed," and, mentioning one distinguished leader of thought, generally, although I think unjustly, regarded as an "adversary of the Faith" he said, "this man could never have been what he is were it not for Christianity."

Lister owed much to his parents and their careful training. As one looks at the portrait of his father, one seems to see in the lines of the face and the firm-set lips, the tireless tenacity of purpose inherited by the son. And in the mother's face one sees gentleness, patience, and sympathy, not unmixed with firmness. I think it is likely that Lister inherited his musical voice and his appreciation of literature from his mother who in her youth had been noted for her exceptional ability as a reader. From both parents he inherited a calm earnestness of purpose, and he followed their advice to "cherish a pious and cheerful

spirit." Gentle, modest, patient, hopeful, brave, undismayed by failure and unspoiled by success he persevered calmly for years in his long

battle with "custom, prejudice, disease."

As a man thinketh in his heart so is he. Thoughts are actions. The mind is the man. I cannot give a better picture of Lister than by quoting his own words. Godlee quotes a letter written to his sister in his early Edinburgh days, telling of his solicitude in regard to his first operations, as assistant surgeon. "Just before the operation began, I recollected that there was only one Spectator whom it was important to consider. One present alike in the operating theatre and in the private room, and this consideration gave me increased firmness. I trust I may be enabled in the treatment of patients always to act with a single eye to their good and therefore to the glory of our Heavenly Father. If a man is able to act in this spirit, and is favoured to feel something of the sustaining love of God in his work, truly the practice of surgery is a glorious occupation."

Writing to me, in 1893, after his great bereavement, he says, "Though I know the time is not far distant when all my surgical activity must come to an end, yet I still feel solace in the old noble work which you and I have loved both for its own sake and because we be-

lieve it to be in the service of our common Master."

In June, 1895, he wrote, "When your letter arrived I was prostrated by an acute attack of traumatic synovitis in the knee. It furnished a striking illustration of aseptic inflammation and aseptic fever, and kept me confined to my room for nearly three months..... I was at Lyme Regis at the time of my illness and had the kind ministrations of my brother and sister and nieces. This long absence from London naturally tended to make practice drop off very much; an arrangement which I think quite salutary, as I feel my active work as a surgeon very much a thing of the past. But I have the satisfaction of seeing ever increasing evidences of the deep and wide roots that the antiseptic principle has struck in the surgical world. I have also had an abundance of interesting objects to occupy me. We are doing much really good work at the British Institute of Preventive Medicine, and no one can say what lies before us in the way of important discovery." This Institute is now known as The Lister Institute of Preventive Medicine.

On New Year's Day, 1904, he wrote to me from Buxton. He told me of a sharp attack of rheumatism which had prevented his usual outdoor exercise and "produced a great effect on my mental capacity, making me incapable of any prolonged effort and greatly impairing my memory. But I have much to be thankful for. My faithful butler Jones sleeps in my bedroom and is most attentive. Miss Syme has

been a most kind and loving companion."

In January, 1905, he wrote: "I think I may say that I have picked up somewhat in strength. But at my time of life, nearly seventy-eight years, recuperative power is naturally not very strong. I have thus a

stronger call than you to look beyond our present state of existence. Without the priceless boon of the Gospel we should have but slender grounds for hope for the future. But with "Life and immortality brought to light by that inestimable gift we may hope for something

far better and higher than anything we have known here.'

And a few months later, "Though you kindly tell me not to reply to your letter (a birthday greeting) I cannot but say, however briefly, that it was extremely welcome to me, and thank you for it. I am glad you had that pleasant meeting with our Toronto friends, Drs. Baldwin and Grasett. I should well like to be able to see them myself. Let me say that although I am very unworthy that such should be the case yet I rejoice if I have been at all helpful to you as regards matters of

the highest moment."

It is noteworthy that both Lister and Pasteur, two of the greatest explorers of the mystery of life, could and did "without usurpation" as Sir Thomas Browne puts it, "assume the honourable stile of a Christian." They both had the child-heart. That "inner light" which illumined the mind and soul of the happy-hearted, thoughtful, busy little boy, which showed him at the beginning of his career, as he said in a letter to his father, that his success depended on his own efforts "under the blessing, if I may humbly say so, of Almighty God in Christ Jesus," this light was an ever-burning lamp in his soul. No one could be much in contact with Lister and not feel that he was in touch with other powers and another world than this. In one of his early pathological studies involving a consideration of the properties of living tissues he says, "here then it appears to me we have a sure though imperfect glimpse of the operation of mysterious but potent forces, peculiar to the tissues of living beings.....forces which I suspect will never be fully comprehended by man in the present state of his existence, and the study of which should always be approached with humility and reverence." And Pasteur with his intellectual humility, "bowed before a Power greater than human power." We are told that he "soared without an effort into the domain of spiritual things. Absolute faith in God and Eternity and a conviction that the power for good given to us in this world will be continued beyond it, were feelings which pervaded his whole life: the virtues of the Gospel had ever been present to him. Full of respect for the form of religion which had been that of his forefathers, he came to it simply and naturally for spiritual help in the last weeks of his life." Those who have read his biography cannot forget that last scene of all. To him was granted the prayer of the Roman poet, Te teneam moriens deficiente manu, as he lay, while one hand was clasped in one of Madame Pasteur, and the other held the sacred symbol of his faith.

Lister had been parted for nearly twenty years from the constant and loving companion of his youth and prime but he had absolute trust in reunion and the life to come. His concluding words in a letter which is one of my chief treasures, the letter in which he wrote me an account of Lady Lister's death, were "May you and I so live during the rest of our time on earth that we may rejoin her." And in another letter he writes, "But it is indeed a grand thing to have hope in a future which will surpass in its capacities, its glories and its beauties all the good that we have ever known here. It often pleases me to think that however different we and our surroundings may be hereafter from what they are now, they will be cared for and provided by the same glorious Creator Whose works we contemplate in this life."

For us, who knew and loved him, who drew so much of the inspiration and ideals of our lives from him, there cannot be any of the sadness that echoes in the old pagan formula of farewell, Ave frater atque vale. Rather would we say, Nunc vale, care magister et amice, atque in aeternum

ave!